DOCUMENT RESUME

ED 375 555 EC 303 392

AUTHOR Crealock, Carol; Kronick, Doreen
TITLE Children and Young People with Specific Learning Disabilities. Guides for Special Education No. 9.
INSTITUTION United Nations Educational, Scientific, and Cultural Organization, Paris (France). Special Education.
REPORT NO UNESCO-ED-93/WS.22
PUB DATE 93
NOTE 84p.
AVAILABLE FROM UNIPUB, 4611-F Assembly Dr., Lanham, MD 20706-4391 (free).
PUB TYPE Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Classroom Techniques; *Cognitive Processes; Cognitive Restructuring; Definitions; Elementary Secondary Education; Foreign Countries; Interpersonal Competence; Intervention; *Learning Disabilities; *Remedial Instruction; Student Characteristics; *Symptoms (Individual Disorders); Teaching Methods; Visual Perception

ABSTRACT

This guide is intended for teachers, parents, and community workers in many countries and provides concrete advice on meeting the needs of children with specific learning disabilities. The guide begins with a definition of learning disabilities and identifies seven areas of disability. It then considers in more detail five areas concerned with cognitive skills: (1) handling complexity; (2) handling tasks adaptively and flexibly; (3) attending to and remembering the differences that make a difference; (4) thinking symbolically, noticing patterns, and understanding concepts; and (5) using reflection/imagery. General principles relating to remediation are then presented, such as: remediation involves starting with students where they are, and remediation promotes self knowledge and alternatives. Several global strategies are described including task analysis, mastery learning, and developing cognitive and study skills. Specific strategies in the areas of language (listening, speaking, reading, and writing), mathematics, social skills, visual skills, knowledge of the body, spatial/temporal perception, and practical skills are offered next. A final section provides guidelines for parents. A glossary and list of organizational resources in 18 nations complete the guide. Contains 11 references. (DB)

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# Children and Young People with Specific Learning Disabilities

by Carol Crealock, Ph.D.
Doreen Kronick, M.A.

Learning Disabilities Association of Canada

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**by Carol Crealock, Ph.D.**
**Doreen Kronick, M.A.**

Learning Disabilities
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**UNESCO, 1993**

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PREFACE

This guide is the ninth in the series on "Guides for Special Education" published by UNESCO.

The guides, which are intended for teachers, parents, and community workers, aim at stimulating discussions on basic knowledge, approaches and methods relevant to the education of children and young people with special educational needs.

The guide has been prepared in response to the numerous queries we have received from practitioners, teachers and teacher trainers for information in this domain. Indeed, the problems of children with specific learning disabilities have been a cause of concern to parents and teachers for some time. This guide provides concrete advice on ways of responding to these needs and thereby making the teaching/learning experience of the student more rewarding and useful.

The views expressed in this guide are those of the authors and do not necessarily reflect those of UNESCO.

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Illustrations: Sarah Kronick

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***Introduction***

Specific learning disabilities have been recognized in some countries for much of the 20th century, in other countries only in the latter half of the century, and yet not at all in other places. Even where they have been recognized, the amount of help available varies from no services to their universal provision. This uneveness in intervention services is tragic since most persons with learning disabilities who receive sufficient, knowledgeable remediation can proceed through the school system, and attain jobs that range from professor to laborer. Conversely, if they are not helped, the possibility of adjustment problems arising are considerable. As our world becomes more complex, the knowledge base increases and the concepts more abstract, an increasing number of people will experience difficulty and be assumed to have a learning disability. Our challenge will be to alter our parenting and teaching approaches so that their potential contribution to our collective lives is not forfeited.

***Definition of Persons with Learning Disabilities***

Learning disabilities are formally defined in many ways in many countries. However, they usually contain three essential elements: a discrepancy clause, an exclusion clause, and an etiology clause. The discrepancy clause states there is a significant disparity between aspects of specific functioning and general ability; the exclusion clause states the disparity is not primarily due to intellectual, physical, emotional, or environmental problems; and the etiology clause speaks to causation involving genetic, biochemical, or neurological factors. This last clause is often stated in definitions, but it is not focused upon since it is difficult to determine etiology and usually is not part of the educational assessment or remedial program recommended for the students.

The most frequent clause used in determining whether a student has a learning disability is the difference between areas of functioning. When a person shows a great disparity between those areas of functioning in which she or he does well and those in which considerable difficulty is experienced, this student is described as having a learning disability (LD). Persons of any intellectual level can have a learning disability, although most countries define a person with LD as having a near normal, normal, or above normal intelligence. Persons with other handicaps also can have a learning disability, and thus are seen as multiply handicapped. LD can affect one or more of a

person's areas of intelligence: language, spatial/ temporal, visual, mathematics, knowledge of one's body and what it can do, social, or practical. Even when one's LD appears to be confined primarily to a specific area of intelligence, frequently there are some problems in other areas of intellect. For example, the person who forgets the phone number s/he has read, also tends to forget the number s/he has been told.

When tasks in any area of intelligence are handled well, they are characterized by: advance planning, reflection, efficiency, economy (done with the least amount of backtracking), appropriate speed, adaptiveness, versatility, appropriateness for the context (particularly one's audience), insightfulness, social value, appropriate maturity, sophistication, complexity, judgment, focus, and elegance. When someone has a LD, one or more of these aspects break down.

***Areas of Disability***

One of the ways that we can think about learning disabilities (LD) is to look at the ways the person with LD handles complexity, utilizes alternative approaches, attends to and remembers important information, uses appropriate judgment, thinks abstractly, notices the patterns in knowledge, and reflects upon what s/he is going to do, is doing, or has done. The following briefly explains what one is able to do when one functions well in each of the competencies:

1. **complexity:** copes with complex information or tasks, or several simultaneous tasks;
2. **adaptivity and flexibility:** recognizes that there might be alternatives one has not considered, and uses them;
3. **attends to and remembers the differences that make a difference:** notices which aspects of information are important and remembers them, ignores and forgets those of lesser importance; knows which agents accomplish what;
4. **judgment:** effects judgments around which option to select, explanation to choose, behaviour to use;

5. **symbolic thought:** ability to think about what language, punctuation, mathematical symbols, gestures, etc., represent, rather than think of them concretely; ability to see generalities across spheres of knowledge; to perceive the patterns that connect knowledge;
6. **perceives the patterns and rhythm of forms in knowledge:** is able to pace productions, distribute the content appropriately; is able to effect closure when part of the pattern is missing or has not been heard or noticed; and
7. **reflection:** ability to think about one's actions in advance, in process and subsequently, and adjust one's productions accordingly; ability to make inferences from successes or failures.

Since LD are disabilities in specific areas of functioning rather than generalized intellectual deficits, we have to ask ourselves in which area or areas of functioning the person with LD has difficulty, and determine whether these problems occur in one or more competencies. Do these difficulties appear in the understanding or production of language, in the understanding and use of space or time, in making sense of and remembering what one sees, in the use of one's body, in understanding mathematics, or in the social or practical realms?

Table 1 summarizes the areas of intellectual competencies, cognitive functions, and behaviours that describe the learning disabilities discussed above.

Table 1

**Interaction Between Intellectual Competencies and Cognitive Function**

| Cognitive Function/ Behaviour | Areas of Intellectual Competency | | | | | | |
|---|---|---|---|---|---|---|---|
| | Language | Spatial/ Temporal | Visual | Mathematics | Knowledge of Body | Social | Practical |
| Complexity | | | | | | | |
| Flexibility | | | | | | | |
| Attention/ Memory | | | | | | | |
| Judgment | | | | | | | |
| Symbolic Thought | | | | | | | |
| Concepts/ Pattern | | | | | | | |
| Reflection/ Imagery | | | | | | | |

In this section, we have introduced the intellectual competencies and specific functions that define the student with learning disabilities. In the next section, we will develop the seven functions that are important for each competency so the educator may recognize dysfunctional behaviour in the LD student. This will be followed by general principles that relate to remediation, global strategies, and specific strategies. Guidelines for parents will conclude the monograph.

## Cognitive Functioning

### 1. Handling Complexity

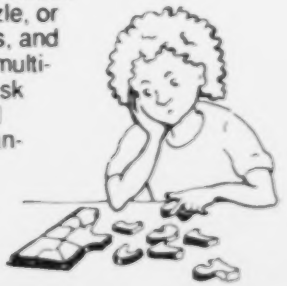
When persons with LD or Attention Deficit Disorder are faced with a number of tasks, or with a task they feel is complex, even if we, who can do it automatically, think it is easy, they may become overwhelmed and give up, or become over-excited, hyperactive, or misbehave. This also might occur if they are in an environment that is highly stimulating, noisy, novel, or confusing.

*(a) Handling Complexity Linguistically*

The language of a person with a language LD may become disorganized when they try to discuss a number of factors simultaneously. Alternatively, they may state a proviso, but lose the main point, or deviate onto a tangent and forget the main point. They might become confused when listening to a long or complex conversation, forgetting what has been said, or focussing on the inconsequentials rather than the important points. They might have difficulty remembering all the parts of a multisyllabic word.

*(b) Handling Complexity Spatially/Temporally*

Persons with spatial/temporal LD may forget their way around a complex building, experience difficulty assembling a complex puzzle, or executing complex mechanical tasks, and remembering how others executed multifaceted tasks. Faced with such a task they may become overwhelmed and approach it randomly rather than planfully. They may have difficulty finding objects when their surroundings are "busy", and may lack systems for storing.



arranging, and finding their belongings. They may have difficulty remembering the months of the year, which months have which number of days, the days of the week, or parts of the day.

*(c) Handling Complexity Visually*

Persons with visual LD may forget how words look, or how they are spelled, and so may forget how to read or spell words to which they have been previously exposed. Or they may recognize a word when they read it, but be unable to remember how to write it themselves. Forgetting how words look, the sounds in them, or how they are spelled may occur immediately after learning a word, after an hour or a day or two, or after an extended time. The LD student may have difficulty reading long words, forget the directions letters of idiograms face, or forget the shape of letters, numbers or idiograms. Just as the person with language LD may veer off topic when discussing a number of events, so may the person with visual LD lose the line from which s/he is reading print or music, and read content from another line.

*(d) Handling Complexity Mathematically*

Persons with math LD may forget number facts, and have difficulty holding math information in their heads while figuring out equations. They may become overwhelmed by a number of mathematical problems on a page.

*(e) Handling Knowledge of One's Body*

The person may be unable to replicate a complex task they have watched others perform, or remember a task they previously have performed. Some may be unable to do different tasks or movements with each hand simultaneously, or different movements of the hands and feet at the same time.

*(f) Handling Complexity Socially*

Some persons with LD may be overwhelmed by events involving a number of people or considerable stimulation, may have difficulty juggling several intimate and casual relationships, appreciating the complexity of relationships, the fact that friends and intimates have good and bad features, disappoint us, and occasionally cannot be counted on. Instead they may concretely

see people as being "good" or "bad" or forget information that is important to their friend.

*(g) Handling Complexity Practically*
In everyday aspects of functioning, persons with LD may have trouble imagining that they can juggle several tasks and chores simultaneously. They may lack a sense of how to juggle their social, vocational and practical commitments, forget what it is they have to do, may not know how to execute tasks efficiently, or how to block out several tasks so that the everyday aspects of their lives could be handled with the least amount of effort and on time.

**2. Handling Tasks Adaptively/Flexibly**
Persons with LD may think there is one fixed way to say or do something in their deficit area of functioning, so they do not necessarily realize or remember that there are alternatives. This contrasts with functional persons who see patterns and hence understand concepts; who recognize that language, mathematics, social interactions, everyday tasks, and the navigation or use of space can be approached in countless ways. Moreover, the poorly developed sense of pattern also means an inaccurate notion of outcomes, so that the LD rigidly cling to the narrow approaches with which they are familiar, and outcomes they can predict accurately.

*(a) Language*
Persons with language LD may not select another way of expressing themselves if what they said was misunderstood or poorly received. Their vocabulary may be more limited than that of other members of their family so they may not have a repertoire of alternative words and phrases they could use, or may forget the words they have heard or do know. They may not understand what has been said if the proviso precedes the condition, such as, "Before you come in the door, take your shoes off." Others may use the same phrases over and over, or talk about the same topic endlessly.

*(b) Spatial/Temporal*
Persons with spatial/temporal LD may be unable to find their way around a building if they enter from a different door. It might not occur to them there are alternative possibilities for organizing their spoken or written language (yes, this is a task that occurs through space and time), their belongings and files, for organizing their tasks or chores more efficiently, or initiating tasks earlier

so they are completed on time. They may not realize there is a more functional way to approach a mechanical task, may not distribute their clothing attractively on their bodies, set out an attractive party table, or have noticed or remembered how others do this.

*(c) Visual*
Persons with visual LD may not distribute their written or art work appropriately on the page so it may be too large or small, run off the page, or may not distribute their work effectively in their notebook. They may not be aware of alternative ways of decoding a word they do not recognize. They may fail to use the index to find information in a book. Instead, they may search randomly.

*(d) Mathematics*
Persons with LD may do mathematics in a rote fashion rather than recognize the many possible approaches leading to the same outcome. They may always use the same strategy regardless of how efficient or effective it may be, or have difficulty understanding questions that are arranged horizontally rather than vertically.

*(e) Knowledge of Body*
Some may have one way of executing a task, however inefficient: may be unaware of different ways of using their bodies to do things, as a form of expression or gesture, or may not have noticed or remembered how others do so.

*(f) Social*
Other persons with LD may have a limited repertoire of social behaviours which bore people, rather than adjusting behaviour to context and adapting it if it is not received as expected. They may distribute content of social language inadvisably, telling an acquaintance everything about themselves when they first meet, or pace intimacy inappropriately such as proposing marriage on the second date. Some may lack an accurate sense of extended time and of a lifespan, and may not have noticed how others pace content and intimacy, which contributes to difficulties with pacing. Others may lack alternative possibilities for solving interactional problems, may see each of their values as being equally important, and so be unwilling to negotiate or compromise. Some may not recognize that outcomes are worked on together. Some LD's may be perseverative--which is

to repeat a topic too frequently or to talk at too great length about a topic rather than discuss their audience's interests, or vary their repertoire. Others may fail to change their image of themselves, of others and of relationships as they, others and contexts change; may not understand how family relationships work, e.g., how they are related to their grandparent or uncle; may have difficulty understanding situations from other's points of view.

*(g) Practical*
Persons with LD may be unaware that there are alternative ways of organizing one's practical tasks including short cuts. When time is limited, they may rigidly resist reallocation of priorities to ensure the most important tasks will be completed. Others may not know which friends and intimates would be prepared to do some of their tasks occasionally.

**3. Attending to and Remembering the Differences that make a Difference/Judgment**

Whenever someone has a LD in an area of functioning, they tend not to notice and/or remember important detail in that area. They may notice and remember inconsequential information which clutters their memory span with items that others would forget. Others may lack judgment concerning what is important or where importance tends to occur, so they study everything, or fail to prioritize and reprioritize. This results in disorganization, inefficiency, failure to complete tasks and feeling overwhelmed.

Since everyone with LD fails to notice some detail in their deficit area, virtually everyone with LD has an attentional problem. On the other hand, people with attentional problems do not necessarily have LD. Attentional problems and/or hyperactivity also can be manifestations of an Attention Deficit Disorder, Developmental Disability, Sociopathy, immaturity, depression, or anxiety.

*(a) Language*
Persons with LD may not know when in the lesson or semester important information will be conveyed, so effect poor judgments about when to be attentive. They may not notice the differences between similar sounding phonemes such as "ch"/"sh", "k"/"g", "v"/"f", which is reflected in their speech and spelling. May forget some of the syllables in words so leave them out when speaking or writing, may not notice the meaning of pauses or silence so control conversation by a continuous barrage of speech. Others

may forget the order of syllables, saying "hangover" instead of "overhang", or use an incorrect word such as "reincarnate" instead of "remembrance". They may not notice voice inflection that indicates meaning, and therefore do not necessarily pick up on humor or sarcasm. Some persons with LD forget meaningful language — in which case their problems may be conceptual rather than memory — whereas others forget rote language such as a telephone number. Some may mention every detail when talking instead of selecting the points that their audience needs to know or would be interested in, and write about every facet. Others may lose the central point because they become distracted by tangents or by background noise or speech.

*(b) Spatial/Temporal*

LD persons may not notice landmarks in space which would help them find their way in a community or building, may not notice the distinctive aspects of people's faces or bodies so they could be recognized subsequently, may not notice the clothing and accessories that others in their group are wearing, nor how they are arranged on their bodies. Some may not notice how others cut their hair, use gesture, movement or social space. Others may not have noticed how others block their time out, or what is involved in doing a task, so they may overestimate the amount of time needed to complete tasks, becoming overwhelmed at what they have to do, or underestimate the amount of time, leaving tasks to the last minute and becoming stressed and discouraged. Some may not have noticed how others preplan the use of space on a page or preplan errands to ensure there is no backtracking, or may not have noticed the patterns of a day or week, what typically occurs at 9 a.m. or on a Saturday.

*(c) Visual*

Some may not have noticed the direction specific letters face, the direction in which to read or write, the sequence of letters in a word, how a word looks or is spelled, how punctuation is used, the size of sentences in different contexts, how paragraphs are used, the use of underlining, or where important content is likely to be found in a textbook, novel, play, etc. When checking their work, they may not notice their errors or omissions.

*(d) Mathematics*

Others may not notice the difference between a multiplication or addition sign, or how the various types of equations are spaced such as the indentation of numbers in multiplication, nor comprehend why such discriminations are important.

*(e) Knowledge of Body*

LD persons may not notice that their hair is messy, their face dirty, buttons improperly aligned, shirt untucked, etc. They may not notice pain or be aware that they have a rash, cut or infection, or notice when they are hungry or satiated, may not attend to detail when bathing or cleaning their teeth. Others may be restless, impatient, have a short attention span, be hyperactive or hypoactive (underactive, lethargic, very disorganized).

*(f) Social*

Some LD students may not notice subtle social behaviours such as impatience or hints, or the subtleties of relationships such as what people do to maintain friends or express caring, or what friends and intimates contribute to relationships such as support. Others may be impervious to others' reactions to their behaviour, and insensitive to others' needs.

*(g) Practical*

Some may not notice house cleaning that needs doing or groceries that need buying, or may not have noticed the systems that others utilize for arranging the practical aspects of their lives.

**4. Thinking Symbolically, Noticing Patterns, Understanding Concepts**

Persons with LD always experience difficulty thinking symbolically in their deficit area of functioning. They fail to notice the patterns that connect knowledge, be those patterns the many equations whose answer is "8", that division is the opposite of multiplication, or that words consist of parts, each of which conveys meaning. They do not notice the pattern of a chapter in a textbook or a mystery so they are unaware of which types of information can be found at which juncture, and therefore, which parts to skim and which to read carefully because they are important. They may not notice the typical pattern of a teacher's class, so are uncertain of what will occur when; they do not know

when their attention can and must not wander. Since they have this hazy sense of pattern, they do not build the anticipation that encourages people who are not LD to persist with the task until the end.

Because their world is unpredictable, they cling to whatever is familiar, either dreading outcomes or being too casual about them, and so fail to prepare for them. Their hazy sense of pattern and hence of pace, distribution and rhythm results in errors of quantity so they provide too little or too much information, write too little or too much, or are too active or insufficiently active.

*(a) Language*

The LD person may interpret language literally so they misunderstand what someone is saying. They think of and write about the most concrete aspects of concepts rather than about the abstract ideas that the concepts represent, or they may connect unrelated information, or misunderstand the meaning of some words, and so make erroneous assumptions. Some may not understand the concepts behind words so that an adult with LD thought that scientists who were not natural scientists were unnatural scientists.

Others may not have noticed typical form in their own language. A 13-year-old English speaking girl, when asked how many ears she had, responded with "13". A 13-year-old who did not have a LD would recognize that if someone wanted to know her age, they would ask, "How old are you?" not "How many years do you have?", since the latter is not the form (pattern) that English speakers use. Since the LD may not have noticed the patterns that others use when they speak, they may not describe events in an organized, sequential, and understandable manner. Other persons with LD may not realize that how they say something carries more meaning than what they say.

Because of their difficulties with pattern, some may not be able to break language into its parts such as the child who thought that "hurtyourknee" was one word. Others are unable to tease out the sounds that make up a word. Systems are patterns as well, so that the LD are unsystematic in their approaches, e.g., rather than memorize information cumulatively with each additional piece of information to memorize, they may start at the beginning.

Spoken language is an abstract representation of experience. Written language is a further abstraction of spoken language. Some persons with LD experience difficulty with reading and writing because they lack the concept that written language is a condensation and selection of experience geared to a specific audience. Some persons have such severe language LD that they lack the language to think about abstract notions such as "truth", "loyalty", or "love". This interferes with their conceptual development which, in turn, limits the maturation of their language. Many persons with LD are unaware that the essential reason for speaking and writing is to communicate with others. This includes negotiating outcomes with others, making ourselves increasingly understood, sharing experience, maintaining our relationships, and providing and seeking stimulation and information.

*(b) Spatial/Temporal*

Students with LD may be unaware of how and why buildings and communities are laid out in a predictable fashion, and so are unable to find their way around a familiar building, community, or one that is similar to those they have encountered. They have no sense of why people organize belongings systematically — be they toys, notes, clothing, or files and so are unable to find things in others' homes, or modify others' systems for their own use. Some may be unaware that people preorganize language given who they are conversing with, and the context in which they are interacting. Others may have difficulty understanding language that uses spatial relationships such as "beside", "taller than Lee but shorter than Joe," or following instructions that involve movement or manipulating materials in space. LD students may have difficulty understanding or using terms that occur in time, such as "consequently" or "yesterday", or understanding cause-effect language. They may not comprehend abstract representations of space such as geography and geometry; how the information on a map is translated into geographic space; may not know which state or continent they live in; may forget which side of the road traffic comes from; may not understand terms like north, south, east, west; may not understand what we convey to others in our use of social space

and so may stand too close or too far, or touch too frequently or infrequently. They may classify objects of events in terms of superficial or tangential characteristics.

Students with learning disabilities may be unaware of how and why people organize, prioritize and reprioritize their time. Some have a poor sense of what time is about, that clock, calendars, and date books indicate the passage of time, and that days, weeks, months, and years punctuate time. They may be unaware that units of time such as a minute, hour, or century are fixed, or be unaware of what a century or millenium stand for, or what "19" means in "1993".

*(c) Visual*

Some students with LD may not understand how written language is constructed, what some words and parts of words mean, the many ways that meaning can be determined, or which parts of words, sentences, or paragraphs can and cannot have their sequence altered. They also may not realize how meaning is determined when reading, therefore making wild guesses about the meaning of words; may lack a system for copying from the blackboard, or may have difficulty relating science diagrams to experiments or to written data.

*(d) Mathematics*

LD students may not understand that mathematics is a language of quantity, or comprehend what various operations such as subtraction do and why, or what concepts such as equivalency mean. They may not know the meaning of zero, comprehend what fractions are, understand the amounts that the denominations of money stand for, or be able to measure cooking ingredients. Some may not notice the positions in space that are used to convey meaning in the decimal system, or may be confused by the wording of mathematics problems, and so do not extract the important data.

*(e) Knowledge of Body*

Other LD students may be unaware of the messages conveyed by eye contact, facial expression, movement, use of social space, gesture, dress and grooming, or how others react to those aspects of themselves. They may misinterpret others' expressions and gestures, and therefore, their intent, may have poor sense of the size and shape of their bodies, and what their bodies can do. Others may forget the names of body parts.

*(f) Social*

Students with learning disabilities may have difficulty appreciating what different relationships give and mean to people, and what different friends and relatives expect. They may not understand the symbolic (or metaphorical) aspects of maturing relationships such as substituting "keeping in touch" for direct touching. Others may not have noticed that people negotiate outcomes together, and so may be controlling rather than collaborative. (Behaviours such as being repetitious, hyperactive, resistant, passive, rigid, or forgetful can become controlling although that was not necessarily their original purpose.) Some may not understand how family relationships work such as what a grandparent or in-law is, that people continue to be brothers or sisters when they are adults, or after they are dead.

*(g) Practical*

Some may have no notion of why people organize their use of time or their tasks, or that they take the expectations of the important persons in their lives into account when deciding how organized to be, how attentive to be and in which contexts, and what events and items to remember.

**5. Using Reflection/Imagery**

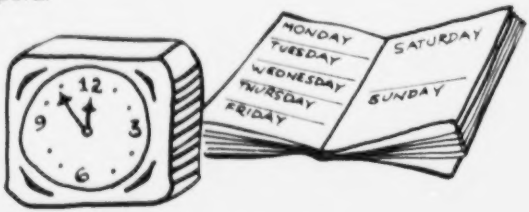
Persons with LD may not realize that others use inner language to preplan what they are going to say or do, to critique their language and actions as they are saying and doing them, and to reflect upon what they have done after it is completed, so that their productions always are in the process of being refined. Nor do they look at the total picture before undertaking a task; they may fail to analyze conditions or identify salient relationships upon which to base a hypothesis.

*(a) Language*

Some persons with LD may not realize that others preorganize their language before speaking, choosing what they will say and how they will say it based upon their own priorities and the priorities they think their audience has, the impression they want to make, the age and sophistication of their audience, what their audience probably knows so does not have to be told, and what they think their audience thinks of them. Nor may they realize that people watch others' reactions to their language and actions, and change what they are doing or saying in process. As a result, their language may be confusing to their listener because it provides too little or too much information, is too sophis-

ticated or complex, or is unduly simple. Without meaning to, they may be tactless, offensive, boring, or fail to address what the audience was seeking; others may react to situations impulsively without thinking about what response would be most favorably received.

*(b) Spatial/Temporal*




Students with LD may not be aware that others preplan their tasks and use of time, use preventative planning such as taking items to school before they are needed or making lists, or that others have contingency plans. Their productions, be they verbal, written, vocational or instrumental, may not reflect the priorities of others with whom they live or work. They may not problem solve the way they do their tasks or their use of time, so that tasks are combined and sequenced to conserve time and energy, and the most important given priority. One adult with LD each day purchased the ingredients for the lunch he took to work, rather than buying a supply for several days. They may have difficulty reconstructing their actions in order to remember where they put something, may jump into tasks or games without listening to the instructions, or before the instructions are completed. Others may fail to preplan the ways they could use space, be it on a page, in a book, or organizing items in their home.

*(c) Visual*

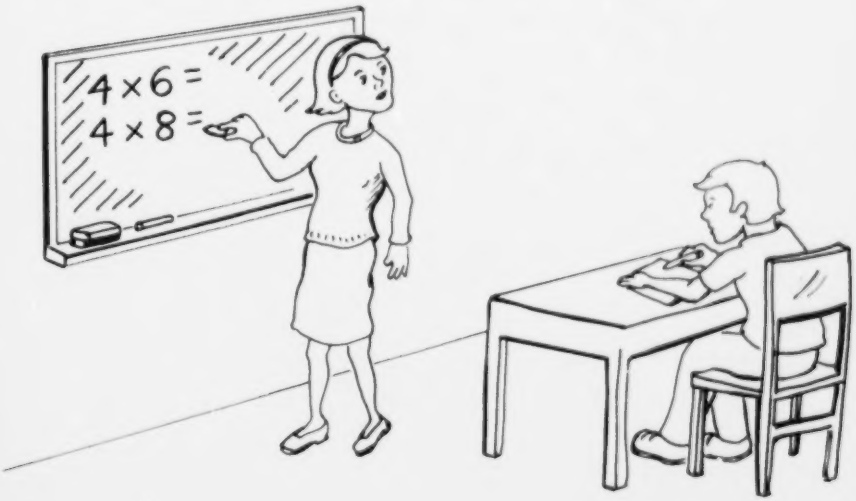
Some LD persons may fail to check their work, or modify their productions in light of what they have learned from previous successes or failures. Assignments might be a poor reflection of teachers' or bosses' expectations in terms of length, neatness, organization, content, or style.

*(d) Knowledge of Body*

Persons with LD may not preplan what they will wear, critique the appropriateness of their attire or their state of cleanliness and neatness, or may not take into advance consideration the impact their gestures, movement, and use of social space will have on others.

*(e) Mathematics*

Some may attack a mathematics problem without a careful assessment of what the language of the problem is requesting, or may copy numbers and math signs incorrectly, and not notice their errors.




*(f) Social*

Failing to take their audience into account before producing a social behaviour is a problem for some LD persons. They may not reflect on the impact of their behaviour on others, and modify appropriately. As a result, their behaviour may be egocentric, impervious, and inappropriate.

*(g) Practical*

LD students may not reflect on whether important tasks and chores are being completed efficiently, on time, and sufficiently well to be acceptable to friends, intimates, fellow workers, and job supervisor.

Table 2 (pages 21 & 22) gives examples of how each competency is manifested in cognitive behaviours.

**Table 2:**
**Matrix Showing Examples of Intellectual Competencies x Cognitive Function**

| *Ability to:* | **language** | **spatial/temporal** | **visual** | **math** | **knowledge of body** | **social** | **practical** |
|---|---|---|---|---|---|---|---|
| *handle complexity* | confused when listening to a long conversation | forgets way around the city or a building | forgets how words look or are spelled. Can't read long word | overwhelmed by several math problems on a page | unable to do different movements with hands & feet simultaneously | difficulty juggling several relation ships | difficulty juggling several chores or errands |
| *function adaptively and flexibly* | unable to express self in different ways to be understood | doesn't generate alternative possibilities for organizing belongings | unaware of alternative ways of decoding a word | has only one rote strategy for each kind of math | unaware of different ways of using his/her body to do things | limited repertoire of social behaviours | unaware of alternative ways of organizing tasks & time |
| *attend and remember* | doesn't notice difference between letters that sound alike (*m,n*) | doesn't notice kinds of clothing others wear or how clothing is arranged on body | doesn't notice difference between letters that look alike (p,q,b) | doesn't notice difference between an addition sign & multiplication sign | doesn't notice that hair is messy, face is dirty & buttons are not aligned | doesn't notice subtle social behaviours such as hints | doesn't notice house cleaning to be done, or groceries to be bought |
| *effect appropriate judgments* | makes erroneous connections | allots too little time to execute commitments or anticipates they'll take longer than they actually will | makes "wild" guesses when reading words | makes outlandish estimates | amount of touch, movement & use of social space makes others uncomfortable | is tactless, blunt. Poor sense of who is likely to befriend him | doesn't reprioritize & reorganize own schedule to get important tasks done |


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**Table 2:** *(continued)*
**Matrix Showing Examples of Intellectual Competencies x Cognitive Function**

| *Ability to:* | **language** | **spatial/temporal** | **visual** | **math** | **knowledge of body** | **social** | **practical** |
|---|---|---|---|---|---|---|---|
| *notice patterns/ understand concepts* | doesn't recognize typical language form & sequence | lacks a sense of how buildings & communities are laid out. Doesn't notice what typically occurs on a weekday | doesn't understand the meaning derived from prefixes, root words and suffixes | doesn't grasp that 4x4 is same as 8x2 or 20–4 | movement is arrhythmic. Is unaware of symmetry of body or what movement conveys | doesn't notice salient aspects of context so misjudges social situations, paces behaviours poorly | doesn't notice how others organize time and tasks |
| *think symbolically* | interprets language literally | doesn't understand geometry or diagrams or maps | lacks the concept of what written language is & is intended to do | doesn't realize math is a language of quantity | doesn't understand meanings others derive from dress, cleanliness, social space, touch,gesture | difficulty understanding what relationships give to & mean to people | doesn't realize why others organize time,tasks |
| *reflect* | doesn't think about impact of what s/he's about to say before speaking | doesn't preplan use of space of time or critique how well s/he's done | fails to check work or to notice errors or omissions | attacks a math problem without careful assessment of what is asked | doesn't preplan clothes needed to buy or clothing s/he should wear | doesn't take audience into account before acting. Doesn't critique own behaviour | doesn't preplan task or critique use of time for errands or chores |

## General Principles that Relate to Remediation

Remediation is a determination of the reasons why a student has been unable or unwilling to tackle a task, and is unable to meet behavioural and/or performance expectations. It is an analysis of how the task has been presented, and the skills and background knowledge that are required to execute the task effectively. These analyses are the most important aspect of remediation, because failure to do any one task may have a variety of possible causes. Some of the questions we might ask ourselves are:

1. Does s/he pay attention to, understand and remember what is expected of her/him? Does s/he understand the language of the expectation?
2. Has s/he experienced so many failures in the past that s/he is afraid to attempt the task and fail, or to express her/himself lest s/he makes an error?
3. Is the task — be it speaking, writing, an academic subject, motor coordination, a chore or a social activity — too complex for her/him or too overwhelming?
4. Does s/he know how to organize the information, and therefore, how to begin?
5. Does s/he have a notion of how long the task will take and how to fit it into her/his schedule? Does s/he reprioritize to ensure that important tasks and commitments are attended to on schedule? Are tasks completed and commitments honored?
6. Does s/he have the prerequisite knowledge? (Never assume that s/he does, regardless or how old s/he is and how knowledgeable in other areas.) Persons with LD have unexpected gaps in their knowledge. Can s/he tell the time, and does s/he understand what time is? Does s/he know how people are related to one another? Does s/he know what state and continent s/he lives in? Is s/he aware of what zero means, of what a map represents, of what formulae stand for?
7. Does s/he have the skills to do the task such as the coordination skills to print or write, or the spelling skills?
8. If s/he is unable to execute the task in the typical fashion, is s/he aware of alternative possibilities?
9. Does s/he perceive the patterns such as (2 times 4) = (4 times 2) = (12 - 4), or notice word families, and the patterns of sentences, paragraphs, poems, text chapters and stories?

10. In what kinds of situations, and with which people do the difficulties arise?
11. What usually happens before the problem occurs?
12. How do others respond? What happens as a result?

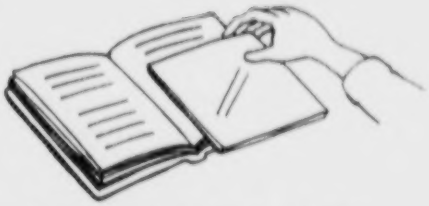
**Remediation fosters an understanding of the patterns and hence rhythm** in spoken and written language, in the use of space such as the layout of communities and the proportions in art and music, in math, nature, science (e.g., achieving balance) in history, in interactions and relationships and in the ways our practical lives are organized. It includes a sense of the ways we pace and distribute tasks and information through space and time. This might involve students determining the number of equations they can generate that have "16" as an answer, creating their own dictionaries so that they notice the relationship between "understand", "misunderstood" and "understandably", or between "bicycle", "bipartisan", "bipolar" and "biology", or noticing the frequency whereby people repeat a topic or the amount of time they spend in greetings and leave-taking. It might mean planning the layout of one's art of printing in advance.

It encourages persons with LD to notice the patterns/rules of language, mathematics, social encounters, time, relationships, history, geology, nature and science. This might involve the patterns of words that sound alike, of root words, spelling rules, or multiplication tables, of the numeric system, the seasons, of birth/maturation/aging/dying/rebirth, the cycles of the economy and of politics, and the fact that everything in the universe consists of systems within systems.

Each facet within a system, be it a number, word, cell, or tree, needs to know its relationship to the other facets, and what it eventually will become. The number needs to know how it relates to the other numbers in the equation and what the equation is meant to do. The verb needs to acquire its meaning by determining how it relates to the other words in the sentence, just as the sentence must determine its relationship to the other sentences in the paragraph, the roots to the tree, the tree to the environment, and so on.

People with LD learn written language most easily when they are taught to recognize as many rules as the teacher can generate, and provided them with poems, ditties or tricks that assist their memory.

**Remediation encourages the noticing of the differences that make a difference.** These might be the agents that supply essential information such as math signs, tenses, punctuation, or the way a letter faces. It involves encouraging the student to use whatever techniques will help her/him to notice important information, be it suggesting that the student color code the letters s/he tends to reverse, place a sheet of cardboard under the line s/he is reading so that her/his eyes do not skip lines, or checks her/his written work by starting at the end and working toward the beginning. It might involve teaching the student to recognize the times in a class or a semester that the teacher conveys the most important information, and which phrases and body stances s/he uses when imparting material that should be attended to and acted upon.



It will involve making the student aware that there are some aspects of information that s/he tends not to notice. This could be: the middle sounds of written words, the ways people dress, voice inflection, people's reaction to their behaviour, whether someone's language is being metaphorical or literal, how others organize their time, their belongings, or remember their important commitments and the articles that they need to carry out the indentation of a multiplication equation. The student learns that s/he will have to make a point of noticing the aspects of information that s/he tends not to notice, although people who do not have a LD can take the same information for granted.

**Remediation includes the analysis of which approaches to tasks in every area of functioning result in acceptable outcomes.** This includes a determination of the ways that such approaches are modified to suit the context. Context includes the priorities, values and mood of one's actual or imagined audience, the time one has and the setting. Effective teachers also are explicit about what they are looking for in an assignment or examination, and how it will be marked. They share with their students the percentage of marks that will be allocated for content, style, neatness, and length, etc. Some teachers delineate the attributes of an 'A+' assignment, of an 'A' assign-

ment, of a 'C' assignment and so on. Some list the areas they want covered in an examination question. This provides focus. It does not compromise the student's writing of the exam because s/he still has to convey what s/he knows.

**Remediation promotes symbolic thought and generalization.** Teachers foster the learning of concepts by encouraging students to find the concepts that connect ideas, both within and between areas of knowledge. This might involve children creating a thesaurus and discussing the similarities and differences between words, or comparing words such as "prefix", "present" and "preset", and comparing words in different dialects of their own language and between languages that have similar origins, or tracing the history of a word and its variants.

It might involve the study of punctuation and boundaries including an examination of the ways that we create boundaries for words, sentences, paragraphs, chapters, books, and the ways that spoken language, mathematics, history, geography, science, space, time, relationships and social encounters are punctuated and bounded. It might involve looking at the ways that change occurs in each of these spheres or how they achieve balance.

When a student has learned ways of attending to and remembering important information, of organizing tasks and time, of noticing how others do so and modifying her/his approaches accordingly, effective teachers then encourage generalization. They might ask him or her how they might attend to or remember important aspects of chores, social relationships, of subjects being studied, and how they might apply the memory strategies used in one sphere of functioning to another. A parent might ask a child how s/he might preorganize a chore, using what s/he has learned about preorganizing the writing of an essay.

When a student has learned how to spell a word, s/he practises using it in sentences and stories before learning to spell another word, and practises a mathematical concept or skill in a variety of problems before learning another skill. This has been called "overlearning".

**Remediation provides the amount of structure that a student needs but not more.** As the student increasingly is able to plan and organize for her/himself, the teacher reduces the amount of structure s/he provides. Structure is the amount of organization/focus, cueing, and predictability a student requires in order to meet demands. One teacher found that by drawing boxes for the letters a student had to print helped her to fit all the letters onto the page. Another teacher solved the problem of a student's mathematical equation running into one another by having the student draw boxes around each equation. Yet another encouraged his student to make lists of what he had to do the following day, and another had her students outline what she was going to speak and write about, before beginning, and to preorganize the writing of a test.

In some instances, tasks, such as the tying of shoes, can be broken into smaller steps. Tasks — be they addition or bed making — can be modelled by the teacher or parent. The adult verbalizes the steps as s/he does them, then the child tackles the task verbalizing the steps aloud. Some students only learn a task if they are taught one step, master it, then are taught the successive step, and so on, be it dressing themselves or learning to use a computer or to swim. They become overwhelmed by lengthy instructions, and forget them. This does not replace the teaching of the underlying concepts, but does teach the technique. When students are encouraged to see the patterns and rhythm/distribution of information and events, this enables them to perceive the structure and outcome. The resultant predictability makes them more comfortable, better able to attempt tasks, and to deal with change.

When we determine the amount of structure each child needs, the scaffolding and protection we provide will vary considerably from student to student. One student may need to work in a quiet place or in his own mini "office". Others will need to be watched for signs when becoming too excited, upset, or overwhelmed. Yet others will need a change in routine described in detail in advance. Some will need explicit instructions, while others understand what they are asked to do only if the language used is brief and to the point. When students work in groups, effective educators ensure that each student knows precisely what is expected of her/him, just as s/he ensures that students comprehend and can execute all the expectations they encounter in the course of a school day.

Structure also involves protecting children from stimulation they are unable to handle, from information and decisions that are inappropriate for children to be involved in, from situations that involve physical danger, from expectations they are not yet able to meet, or from impulsive behaviour, anger and other loss of control. It involves our modelling the extent to which situations should be upsetting. It includes being the student's advocate with fellow teachers, administrators, other students, and possibly the community. It means adapting the schedule, equipment, classroom layout and rules, in order to increase the student's comfort. It provides the focus and containment that all children need, and that children — who tend not to notice patterns, interpret each situation and demand as novel and consequently are stressed — require in greater measure. Our goal with all children should be to make them aware of the types of situations in which they need structure, and to provide it for themselves. When too little structure is provided, persons with LD may be too confused and anxious to learn or comply. When more structure is provided than the person requires, then s/he tends to become dependent.

**Remediation involves taking students where they are at.** This means that, regardless of their age, there may be a concept that they do not know, a metaphor they do not understand, or a simple word that they misinterpret. They may lack the motor coordination to do complex tasks with ease and grace, may only be able to master a less demanding task, or to learn the skill step-by-step. However, in other areas of functioning, they are likely to have no difficulty with complex or abstract tasks. Some persons with LD may never be able to spell a foreign language well, but may be able to learn to speak it. Others experience as much difficulty perceiving and remembering the sounds and inflections of a foreign language as they do those of their own language. Nonetheless, some of them may be able to learn to write the language. Some students with LD have great difficulty with mathematics, but are exceptional speakers and writers, artists, or musicians.

Effective educators allow students to progress in the areas of the curriculum in which they can cope, while not being held back by what they are unable to do well. They ask themselves what it is they can get from their students, if the students are unable to meet age-expected demands. They allow students to convey their knowledge in whatever fashion the student is able. They rank the attributes they are marking in importance, so allocating more marks for concepts than spelling, or give separate marks for each. They find ways around problems such as teaching a student with coordination problems to type, while still attempting to teach her/him to write.

**Remediation fosters a sense of audience.** This might involve having students with LD tutor fellow students or younger students, and become involved in volunteer work. Remedial teachers empathize with their students' experiences, and comment on them, "That must have been difficult", "You must be so pleased", or "I noticed such and such happening to you", in order to model other-centered behaviour. They also promote give and take, compromise, and negotiated teaching, which provides a sense of working toward outcomes that must be acceptable to everyone involved. Compromises also entail an assessment of which values one can and cannot relinquish. Effective teachers encourage students to preorganize what they are going to say in light of the impact that they want to make on others, and others' values, e.g., for grammatical language, no swearing, etc. They ask students to restate what they have said more tactfully. They ask students what they think their teacher expects on an assignment, and whether the assignment they presently are doing will or will not please their teacher, and why. They discuss who an author's probable audience is and the reasons for their assumption. They discuss what the author assumed her/his audience knows, and therefore, omitted from the text.

**Remediation promotes self knowledge and alternatives.** Students learn to recognize the approaches they use that are adaptive, and what they do that is counter-productive. The latter might be not having noticed what others expect, not checking out their notion of what the expectations are, not checking their work with sufficient care, not noticing how others dress or how they react to one's interactions, approaching tasks, games and social encounters impulsively, not repairing one's errors, or becoming overwhelmed by expectations. They learn to ask

themselves whether there is another approach they have not considered, another explanation to the one they have assigned, or a trick that would get them over the hurdle, such as a trick that would prompt them to begin an assignment, or to complete it on time. Students increasingly are encouraged to invent their own interventions, to evaluate, and modify them. They are supported in attempts to explain to others the modifications they require if they are to function successfully to become their own advocates. Effective remedial teachers continuously turn the problem over to the student. They also educate and support mainstream teachers and parents so they can assume increasing remedial responsibility. They elicit the support of fellow students, administrative staff, and the community in the collaborative process of promoting growth and change.

**Remediation uses areas of strength to bolster areas of weaker functioning,** e.g., persons who do not remember how to find their way around a city might learn to talk their way through space and use stable landmarks. Those who forget how a word looks might trace it with their finger, cut it out of sandpaper and trace it, write it on their skin with a wet paint brush, or trace it in sand while saying it. Others might remember spatial configurations by verbalizing them, "It goes up like stairs".

While we are remediating, we also are teaching the person to compensate. We do so because s/he may never become superbly functional in her/his area of deficit. We also do so because everyone uses compensations or crutches such as shopping lists, notes on the door, or leaving the items we need to take to school or work at the door the previous night. Students with LD are encouraged to notice the compensations others use, to decide which ones they will use, and to critique them. They also are encouraged to modify their compensations as contexts change, such as changes in their memory as they age or are stressed, or in the items they are expected to remember.

## Global Strategies

There are many general approaches that help the LD students in their weak areas, many of which fall into the behavioural approach. The most significant ones include positive reinforcement, immediate and specific feedback, task analysis, rehearsal and practice, and structural development of remediation.

Most LD students have a history of failure. Therefore, before academic programmes can be expected to be very successful, LD students need to experience positive reinforcement. This positive reinforcement should be both general, e.g., "It's nice to have you in our class Mary," and specific, e.g., "You have spelled eight words correctly on your spelling quiz, Mike, great!". Few people tire of positive reinforcement, least of all the learning disabled student. Behavioural strategies that make success a frequent experience are task analysis and structured approach.

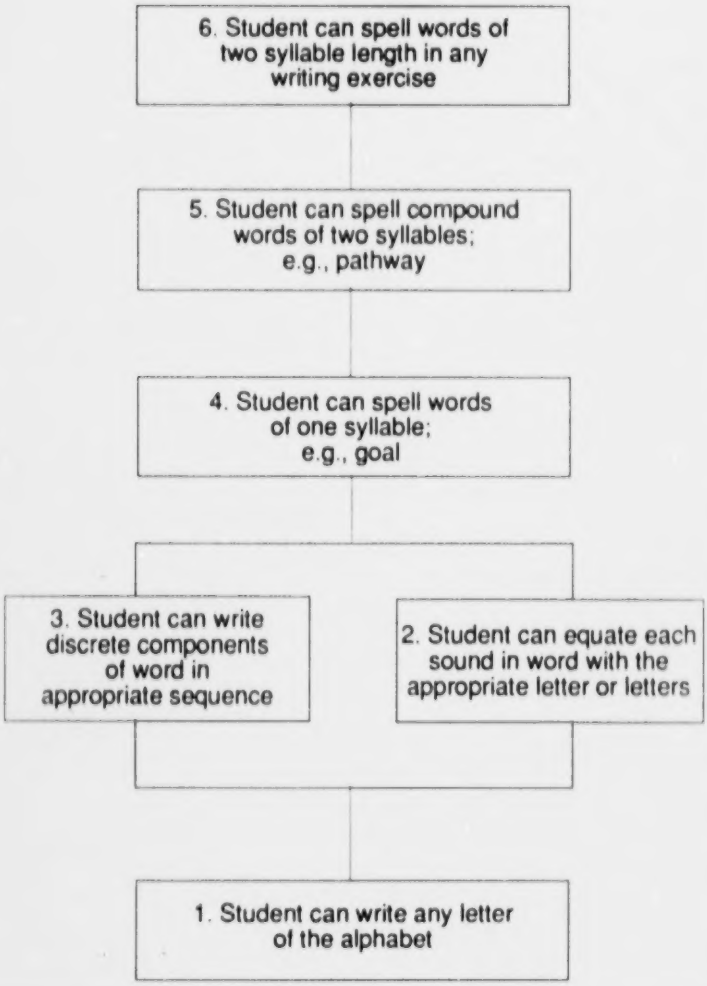
The first step in developing a task analysis is to decide upon the final goal you have set for the student in the area of concern. This is followed by the next steps:

1. state final goal in behavioural terms;
2. determine all the prerequisite subskills required;
3. examine each of these subskills to determine whether there are less demanding skills the student needs to know;
4. continue with step three until you reach the student's entry level — the point where the student already knows how to perform the skill;
5. plan the remedial unit, starting from the lowest level of skill and working up to the final goal. Figure 1 is an example of task analysis. The planning starts with "6. Student can spell words of two syllable length in any written exercise" and works down through the necessary subskills to the entry level at "1. Student can write any letter of the alphabet." The teaching starts with a review of skill one and works up to mastery of skill six.

   This model not only ensures that the teacher does not ignore prerequisite skills, but also that unnecessary skills are not taught. Task analysis leads naturally into a carefully structured remedial program.

**Figure 1**

**A Learning Hierarchy for Spelling**

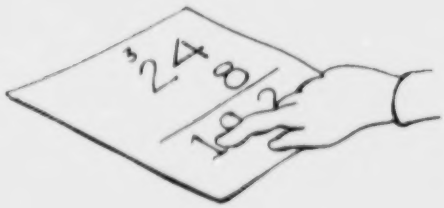

6. Student can spell words of two syllable length in any writing exercise
5. Student can spell compound words of two syllables; e.g., pathway
4. Student can spell words of one syllable; e.g., goal
3. Student can write discrete components of word in appropriate sequence
2. Student can equate each sound in word with the appropriate letter or letters
1. Student can write any letter of the alphabet

Rehearsal and practice involve structured practice of specific behaviours. The goal of this approach is to enhance skill acquisition and maintenance after the LD student has learned the basic skill. Worksheets that are part of seatwork and homework are essential for the LD student since they need more practice than the non-handicapped student if they are to internalize basic skills like spelling, multiplication tables, and verbal decoding.

Immediate, specific feedback provides reinforcement to the LD student on a regular basis. It ensures that the student does not waste time waiting for feedback, nor continues to do work in an incorrect manner.

Mastery learning approaches demand that the student learns the skill at a ninety to ninety-five percent success level. Programs presented at an appropriate speed and level accompanied by quick feedback offer success to the LD student.

A second general approach to remediation is based on cognitive skills. This includes modelling, peer coaching, mnemonics, study skills and so on. Modelling involves teachers showing students how to think about doing a task, and involves students practising the same behaviour. Few LD students know how to think about solving problems, and unfortunately many teachers do not show them how. For example, if the student is asked to multiply 24 x 8, the teacher would not just remind them of the eight times table and how to carry, but would also talk out loud to model his /her thinking for the student: "Eight times twenty-four is my problem. Well I will write it down on paper with the twenty-four on the top line and the eight under the four. Then I will draw a long line under the problem. Next I multiply the four by eight and put the two in the ones column and carry the little three above the two in the tens column. Then I multiply the two by eight, get sixteen and, oh yes, I have to add the little three so I get nineteen. Then I write down the nineteen in the hundreds and tens columns.



The answer is one hundred and ninety-two. I had better check my answer. Yes, that is right."

Study skills are important for the older LD students. A great deal of practice and review is necessary for the LD student if he/she is going to remember material under the pressure of quizzes and examinations. The following methods are suggested to help LD students study and remember more effectively:

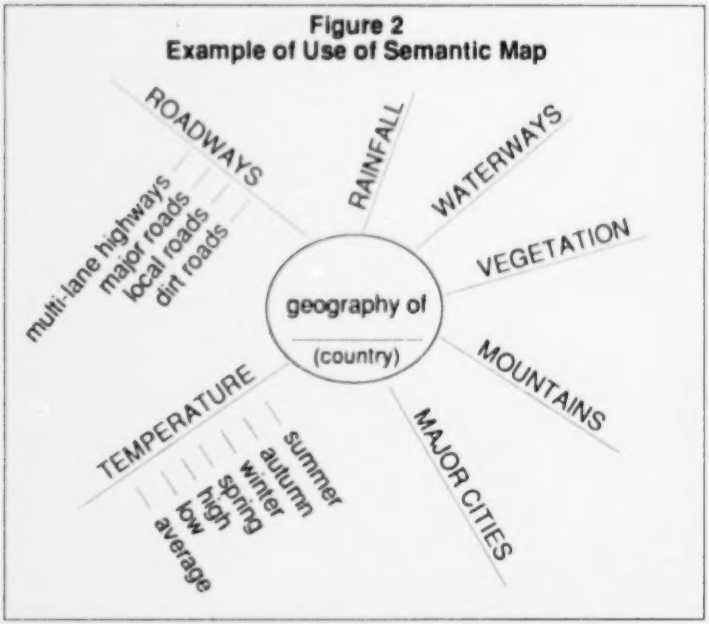
1. **Intensify Attention.** Underline important points in texts, attend to the dominant features of maps, colour-code frequently occurring themes.

2. **Mnemonic Devices.** These help students remember unfamiliar material by connecting it with that which is familiar. Words and sentences formed by the first letter of each concept are helpful. For example, in Canada, the acronym HOMES is a reminder to the student of the five great lakes — Huron, Ontario, Michigan, Erie and Superior. UNESCO is a word that stands for United Nations Educational, Scientific, and Cultural Organization.

3. **Chunking Information.** Most people can work with five to nine bits (or chunks) of information at the conscious or working level. In order to increase the actual amount of information a 'bit' represents, you have to group attributes together. For example, a seven digit number (4021975) may use up all of a student's working memory if each number takes up one bit. On the other hand, if the first three numbers can be grouped as one (the first three numbers are the area telephone number), and the second four as one (the year your daughter was born), you have only used up two bits of information and so have five more bits of working memory available in conscious memory. In this case, the number can be incorporated into a larger segment of information. An example might be: "My uncle's phone number is 4021975. He lives in Belgium."

Another way to help LD students group information is to show them how to use a semantic map. If students are studying the geography of their country, this is one way to organize the information. They start with the main topic in the centre, group the essential attributes into five to nine spokes, and then fill in more specific features as shown below.

**Figure 2**
**Example of Use of Semantic Map**




In using this approach to retrieve information, the central topic is given in the question. This then triggers six main subtopics, each of which brings to conscious memory four to five smaller issues of content which can then be discussed. Each aspect of this answer is linked to others which are retrieved from long term memory.

4. **Rehearsal.** Learning disabled students have to rehearse both strategies and information more frequently and efficiently than non-LD students, in order to internalize basic knowledge. Auditory approaches involve listening carefully



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and then repeating the material. This can include directions, spelling words, multiplication tables, etc. Saying information aloud can reinforce the material that needs to be learned. Tactile or touch approaches can also involve the body in learning. Writing individual words or groups of words on one's back introduces another way of using one's senses. Spelling words in the sand or on the pavement is helpful. Visual approaches are essential to all basic subjects. In addition to copying basic information, imagining connections in a bizarre visual form can introduce rehearsal in a different manner. For example, imagine a big slithery snake spelling the word SNAKE, or flames shooting up to spell FIRE.

5. **Practice.** As much practice as the LD can find time for, the better. Correct spelling, additional vocabulary, reading, arithmetic computation, etc., all need to be internalized so the LD student does not have to spend time on basic skills when cognitive, creative skills are required. If the LD student is older, encourage him/her to help younger children; if computers are available, encourage the student to use drill and practice software.

## Specific Strategies

Given the general principles and suggestions on global strategies described above, we will now return to Table 2 to provide more specific remedial suggestions in each of the seven areas of intellectual competencies.

### 1. Language

Language is the most essential of the intellectual competencies. It is usually composed of four individual abilities: listening, speaking, reading, and writing with development occurring in this order.

*a) Listening*

Listening involves attending, processing information, and having enough knowledge of vocabulary and content to put a speaker's speech into a meaningful form. Learning disabled students often do not attend effectively and so even if they have the other skills,

they do not understand the discourse. Problems with attention and distractibility are found in many LD students. There are many ways that help alleviate this that include:

i) reduce verbal distractions. Have the student sit in a quiet part of the classroom, practice listening to only one other student, then to a small group;
ii) have the student maintain constant eye contact with the teacher or peers that are talking. If your culture does not encourage eye contact (e.g., the North American Indian), sit beside the student and speak quietly so he/she has to attend if he/she is to understand what you are saying;
iii) have the student sit close to the front of the class--this naturally blocks out much distraction;
iv) schedule difficult lessons when the student is most alert;
v) allow the student to move around if this helps him/her concentrate; and
vi) give short assignments and try to provide immediate feedback.

Listening also involves being able to process discourse. This includes hearing words clearly, perceiving them accurately, and remembering the passage in order. LD students do not have hearing difficulties as a primary disorder, but some do have problems with auditory discrimination. For example, a student may confuse the words 'patience' and 'impatience'. You can help a student by facing him/her, saying the words distinctly, and speaking slowly so he/she can process all the parts of the word. Perceiving the words clearly can be difficult. Transposing sounds is a well-known problem for the LD student. You may be talking about 'form' but he/she will hear 'from'. These students are helped by repeating words or by listening to words on a tape recorder. Another approach is to say one word, follow it by a pair containing the original one, and then asking the student to identify the correct one. For example, say 'school'; then say 'spool' and 'school', and finally, ask the student which word you said originally.

The last important skill in processing discourse is being able to remember a sequence pattern. For example, the teacher may say, "Good morning children, take off your coat, come to the circle, and we will talk about our day." The student may remember each part of the instruction but not in correct sequence, so he/she may come to the circle, and then take off his/her coat.

Or he/she may only remember the first and last phrase and not know where to go. This student can be helped by embedding the instruction in a classroom routine. If this opening activity is always the same and you express it in the same verbal manner each morning, the LD student can learn the sequence. Once this is accomplished, you can add additional parts or change the instruction, one part at a time.

The third aspect of listening involves knowing the vocabulary and context in which it is being used. Experiential approaches to language are helpful because the student can use words and experiences she or he is familiar with. If she has just had a birthday party, she will listen more carefully to a story about a classmate's party or about a party in the story the teacher is reading.

Listening is often a problem for the LD student because the discourse is too complex, the words too difficult, the sentences too long, and the concepts not fully understood. The student may understand the parts, but is unable to construct the whole. For example, if the teacher is talking about 'black holes', the LD student will understand the individual words but not know that the teacher is talking about dungeons.

*b) Speaking*

Speaking is the second aspect of language with which the LD student has difficulty. By the time a student is in grade one, most students can speak approximately 3,000 words and understand 15,000. Effective parents have expanded their children's language by using their vocabulary and context, and modelling an extension. For example, the child may say 'Me want milk" to which the mother replies, "Yes dear, you want some milk". There is never a negative response from the mother, but a model of a better way of saying the same thing. This approach to expand language by the teacher is also appropriate especially when the goal is to help the LD student use correct grammar. An example a grade 3 teacher might use is:

*Student:* "Me need crayons"
*Teacher:* "Yes Mike, you need some crayons"

The teacher can increase the salience of the correct response by saying: "I will get you some if you say 'I need some crayons'".

This is using both cognitive (modelling) and behavioural (positive reinforcement) approaches to help the student improve his/her language.

In the previous section on listening, we suggested that providing a routine for when and what language is appropriate was helpful. The LD student can improve his speaking in much the same way. For example, all children can be expected to say, "Good morning", talk about their day, join in choral reading, and repeat instructions. Answering orally to a teacher, or peer, or using a tape recorder if that is available, and then counting the number of words used can be an effective means of evaluating both correctness and quantity of spoken language.

Summarizing events or passages read by the teacher or peers is an excellent way to improve both speaking and reading comprehension. This will be expanded in the reading section, but suffice to say that summarizing is rarely expected in the regular classroom. But when it is, the LD student gains in all aspects of language.

*c) Reading*

There are three essential aspects of reading: decoding, comprehension, and speed. The LD student may have difficulty with each. Decoding is the first and most crucial skill. If the student does not have this skill, he/she needs to use most of his/her working memory figuring out letters, syllables, words, and sentences. Basal programs that are well structured are usually most appropriate for the LD students. The first step is to match sounds to letters and to rehearse until it is automatic. After this, combining consonants and vowels in ever increasing quantity allows the teacher to build up the students repertoire. For example, start with 1. CV and VC combinations (ta, at); 2. CVC, VCC, VCV, VVC (cat, off, ate, eat); 3. CVCV, CCVT, CVCC (late, clot, kiss) and so on. In some languages, there are also syllables and words that do not follow the sound/letter sequence and require practice with sight methods. For example, sight where the 'ight' makes the 'it' sound, or thorough where 'ough' makes the 'ow' sound. Many schools have books that have ordered letters, syllables, and words for you to use in working with LD students.

In addition to learning how to decode sounds and words, the student also has to learn the meaning of the vocabulary and comprehend the entire sentence, paragraph, and passage. Research has shown that students are able to learn and remember material they are familiar with more efficiently than material with which they are unfamiliar. For example, most countries have a sport that is popular across the nation. Learning words that identify with that sport and reading stories about it make reading more interesting. In Canada, hockey is our national sport. Words like 'puck', 'stick', 'goalie', 'team', 'ice' are usually easy to learn because they are already in the lexicon of most students.

In addition to teaching LD students the sounds that make up words and the vocabulary that leads to comprehension, it is also important to make the student personally responsible for his or her own approach to reading. Reciprocal reading is an approach that focuses on making students move from being dependent to independent in their reading activity. Palinczar has developed a program that includes four aspects:

i) summarizing — where the student is asked to summarize the passage being read;
ii) questioning — involves asking who, what, when, where, how, and why, such as 'what are we reading?';
iii) predicting — asks what is coming next or what is the title of this story and so on; and
iv) clarifying — which asks the student to define difficult words or shows how to use context clues.

An example of this from the text would be, "A snake's body is very flexible, it can bend and twist very easily." The student then defines 'flexible' as 'something that can bend and twist easily'. The essential goals of this program are as follows:

i) to understand the purposes of reading, both explicitly and implicitly;
ii) to activate relevant background knowledge;
iii) to attend so that concentration can be focused on the major content at the expense of trivia;
iv) to evaluate content critically for internal consistency, and for compatibility with prior knowledge and common sense;v)to monitor ongoing activities to see if comprehension is occurring by engaging in such activities as periodic review and self-interrogation;

vi) to draw and test inferences of many kinds, including interpretations, predictions, and conclusions, and
vii) to move from a dependent to independent reader.

The following two passages show how a group of grade six learning disabled students grew in skills from dependence to independence:

TEXT: Spinner's mate is much smaller than she is, and his body is dull brown. He spends most of his time sitting at one side of her web.

CHARLES: (No question)

TEACHER: What's this paragraph about?

CHARLES: Spinner's mate. How do Spinner's mate...

TEACHER: That's good. Keep going.

CHARLES: How do Spinner's mate is smaller than...How am I going to say that?

TEACHER: Take your time with it. You want to ask a question about Spinner's mate and what he does, beginning with the word "how."

CHARLES: How do they spend most of his time sitting?

TEACHER: You're very close. The question would be, "How does Spinner's mate spend most of his time?" Now, you ask it.

CHARLES: How does Spinner's mate spend most of his time?

Here, the teacher directs the lesson by asking 'what' and 'how' questions. The student is dependent on the teacher for the form of the question, and for understanding how to get information from the passage. In this next passage, some weeks later, Laura has taken over the teacher role and is asking clarification questions and making predictions. She has become a more independent reader, and the teacher's role is to move the action from student to student as they demonstrate their growing independence.

TEXT: The second oldest form of salt production is mining. Unlike early methods that made the work extremely dangerous and difficult, today's methods use special machinery, and salt mining is easier and safer. The old expression "back to the salt mine" no longer applies.

LAURA: Name two words that often describe mining salt in the old days.

KIM: Back to the salt mines?

LAURA: No. Angela?

ANGELA: Dangerous and difficult.

LAURA: Correct. This paragraph is all about comparing the old mining of salt and today's mining of salt.

TEACHER: Beautiful!

LAURA: I have a prediction to make.

TEACHER: Good.

LAURA: I think it might tell when salt was first discovered, well, it might tell what salt is made of and how it's made.

TEACHER: O.K. Can we have another teacher?

The last aspect of reading involves speed. Many LD students become proficient in decoding and comprehension, but they continue to be slower than the average student. Rough estimates of appropriate speed are 86 words per minute at the grade two level, 155 at grade four, 206 at grade 6, 237 at grade 8, and 251 at grade 12. Learning disabled students often require two to four times longer. One of the most effective ways to increase speed is to have students read aloud daily for two minutes. The teacher will time them and ask them to count the number of words they have read and then graph them. The words they read can progress from single syllables, same words, different words, phrases, short sentences, increasingly more complex sentences, and whole passages as they become more efficient readers. This technique is effective and fun for most LD readers.

*d) Writing*

The last aspect of language is writing. Many LD students become skillful in speaking, listening, and reading, but continue to have problems with writing, especially as they get older and the writing demands increase. A basic approach to improving writing is to have students write more. Scardamalia and Bereiter have observed that LD students spend considerable time (one to two years) writing before the quality of their work improves. Students with learning disabilities usually need practice in both the technical and narrative aspects of writing. In the previous reading section, we discussed the importance of speed in aspects of language. Fluency in writing is also required. Timed exercises as described in reading are also useful. Having students write anything for two minutes increases their quantity. You may want to structure this as you did with reading, starting with single letters, words, and sentences. This introduces an automaticity into writing that is necessary before LD students become fluent writers. It also introduces students to observing and practicing the patterns in writing.

The technical aspects of writing include punctuation, handwriting, grammar or style of writing, and spelling. LD students need to understand that the rules of punctuation are important not just in making their writing look well, but also to mark the language groupings that aid comprehension to reduce the complexity of the task. The most basic rules of punctuation are that sentences start with capital letters and end with periods. Within sentences, commas break up the parts that help the student read and write in rhythm. Understanding this helps the student organize his or her work and that of others. Once the students can use the basic punctuation rules effectively, they can go on to use more complex forms such as semi-colons, colons, quotation marks, question marks, exclamation marks and so on.

Handwriting is important for both the reader and writer. Many LD students have problems with fine motor coordination skills that interfere with adequate writing. Approaches that can be helpful are:

i) to practise with large lined sheets of paper, copying words that the teachers have modelled, many times over;
ii) use manuscript rather than cursive form when writing. Letter by letter is often clearer and just as fast once the student has practised often enough to become fluent. If the student feels this is a form that only young children use, teach him/

her to join letters — a form of print that works well and is easier than learning the cursive form, e.g., turn becomes
school becomes

Many LD students need considerable practice in both spelling and decoding individual words. This is often referred to as over teaching and over learning. The words that require this approach are those that are most frequently used in both reading and writing. Table 3 indicates an example of high frequency words. These words account for approximately 58% of the word count in reading and writing. Many LD students have difficulty with these simple words and need to 'over learn' them. Single word worksheets as shown in Figure 3 offer students opportunities to practice words they have difficulty with, both at home and at school. This approach encourages LD students to attend and remember words through giving them practice in visual discrimination, visual imagery, and kinesthetic experience.

**Table 3**

**One hundred words most frequently written by elementary school children in grades one through six**

| | | | | |
|---|---|---|---|---|
| the | had | very | see | and |
| said | if | well | I | like |
| not | an | a | but | be |
| now | to | have | little | dog |
| was | got | could | people | in |
| were | home | over | it | are |
| this | by | he | at | down |
| man | we | me | can | big |
| my | go | back | into | of |
| up | as | come | is | all |
| about | has | on | with | them |
| did | you | day | saw | play |
| they | this | house | once | that |
| out | two | too | were | would |
| mother | their | when | get | from |
| off | then | him | our | or |
| for | her | what | your | she |
| came | do | know | there | some |
| time | dad | one | because | just |
| around | so | going | after | us |

(These 100 words and their repetitions account for 58% of the total word count)

**Figure 3**

**Example of a Single Word Work Sheet**

NAME: _____

**Talking**

1 He gets into trouble because he is always talking.

2 Look at the word "talking". Close your eyes and picture it. Does the picture in your mind match the word?

TALKING

3 Circle all the correct spellings of "talking".

| | | |
|---|---|---|
| talking | telling | talking |
| walking | taking | tolling |
| balking | talking | stalking |
| baking | tilling | talking |

4 Fill in the missing letters.

| | |
|---|---|
| talkin___ | talk ___ |
| talk ___ | tal___ |
| t__king | ta___ |
| t__ing | t___ |

5 Circle only the letters in each row that spell "talking".

t a m n l o k t i n b g
z t y l a l o k i n d g c
g p t a l q r k s i n i g

6 Circle all the correct spellings of "talking".

| | | |
|---|---|---|
| talling | talkimg | talking |
| talking | talkiny | talling |
| takking | talking | talkin |
| talking | talkeng | taling |

7 Trace over each word pattern. talking talking talking

8 Write the word "talking" three times.

1. _____
2. _____
3. _____

9 Turn the page over and write out the word "talking". Check it.

Grammar may be a serious problem for the LD student. Agreement of verb tense throughout a written passage and agreement between subject and predicate (noun and verb) are the most basic errors made by LD students. Most teachers do not penalize students for these, but they should correct them. While these errors are found so frequently, many LD students do not have a correct imprint to refer to when they are writing. This is especially true when they are in whole language programs that use students' writing as their reading base rather than commercial materials. Students should practice correct grammar forms through continual repetition and thorough knowledge of the rules that govern correct grammar.

A frequently used cognitive strategy for LD students who need techniques for technical editing is COPS. This approach has been developed in the learning disability institute at the University of Kansas (Schumaker, Deshler, Alley, Warner & Ellis). COPS is a mnemonic that helps LD students remember (and thus be responsible for) the essential aspects of editing.

C represents Capitalization;
O represents the Organization and Orderliness of the story;
P represents Punctuation; and
S represents Spelling.

When a student finishes the first draft of a written passage, he/she should then 'do a COPS' for technical correcting. The teacher may have to remind the student to do this initially, but eventually it should become internalized.

The following passage is an example of the first draft of a free form poem. This grade eight student had good creative skills, but his technical skills in writing were very weak.

> "A old man unwanted with nothing left but a cold fittil. two broken string and out of toon just like the fittel hes broken harted and behind in times. Live on old man live on."

Here is the final draft of the same poem. The essential remediation here involved reminding the student of basic punctuation and capitalization rules, and practising two spelling corrections — *fiddle* and *heart*.

An old man,
Unwanted,
With nothing left
But an old fiddle,
Two broken strings
And out of tune.

Just like the fiddle
He's broken hearted
And behind the times.
Live on old man.
Live on!

The narrative and expository aspects of writing also need to be assessed. Young LD children often show good oral language; in fact, the discrepancy between their written and spoken language may be one of the ways of identifying students as learning disabled. As these same students grow older, however, they have fewer experiences with written and oral language. Adults do not read to them, and their own ability to read and write is at a much lower level than their developmental age would predict. Non-handicapped students are not always taught how to write well, but most pick up skills spontaneously; students with learning disabilities need to be taught directly. For example, if an older student is expected to answer questions on a test in history, he or she should know how to summarize important topics in the course and retrieve them at examination time (these skills were discussed earlier in the reading section). If the student is expected to answer a question that asks for an opinion or argument, the student should be directly taught a structure. For example, the teacher would teach the following format:

i) opening statement of student's opinion on the question;
ii) three statements that support the opinion;
iii) statement of contrary opinion;
iv) reconciliation of contrary opinion and student's own;
v) concluding statement that reaffirms the initial statement.

Many learning disabled students have poor organizational skills and poor sense of time. If the teacher expects them to do a project in science, the specific content may not be the problem. What is involved in the project, how it is to be organized, and what time frame is required are often more problematic. A student who has difficulty with attention and perseverance may

be in trouble before he/she even starts. Judging what is possible and planning a personal timetable will be essential. The teacher often needs to help the LD student plan these features. For example, if the grade five project demands five hundred words with illustrations and must be submitted to the teacher at the end of the month, the LD student will need organizational support in several areas. The first is time. The teacher has assigned a project at the beginning of the month so the student has four weeks to complete it (lots of time, he or she thinks). If this is to be a successful experience, however, the teacher has to help the student find a topic, design a cover page, show where to look for reference materials, decide on illustrations, decide what to include, develop a timetable for meetings with the teacher, and a personal timetable so that everything will be done within the month. All students would benefit from this, but for the LD student, it is essential.

Narrative writing is part of the language program for many students from grade one through secondary school. We discussed some of the technical support skills earlier; now we will address the composition itself. In many countries, students are asked to use their own experiences from which to develop stories. For those whose creative skills need to be augmented, brainstorming ideas and vocabulary can be especially helpful for the learning disabled student. The following example was helpful with a young LD girl:

i) Find a title: The Monster.
ii) Think of at least eight words that go with the idea 'Monster'. Write them down (check their spelling).
iii) Number your words in an order that you would use them in your story. Cross out any words you do not want to use.
iv) Write your story. Read it to someone.
v) Do a 'COPS' to check your spelling, grammar, and punctua tion. Correct your mistakes.

| **Words:** | | |
|---|---|---|
| | 1. scarry | ugly |
| | 4. stupid | antennae |
| | 2. 72 eyes | gross |
| | 7. cute | 6. big feet |
| | 5 weird | 3. ten arms and legs |

"Once there was a scarry monster who had 72 eyes he had ten legs and arms. I don't think he is very smart amatterofact he was weird. Well anyway one day he started school. nobody new him and nobody liked him either. They called him big feet. But in the end he was very smart. And they called him cute. And did you know right now that same monster is your dad."

In this case, the initial brainstorming helped the student with both ideas and vocabulary to use in a creative story. The vocabulary items were correctly spelled and putting the words in order helped bring order to the ideas. This young girl (eight years old) was creative, but she had difficulty with spelling and organizing ideas. This approach helped use her strengths while getting support in her weak areas.

Process approaches to writing can be both flexible and structured. One writing program for narrative writing is the grid model developed by Crealock.

i) The first stage is the development of the grid. This can be whatever size suits the capabilities of the student, e.g., 5 x 4 for young students (six to nine years), working up to 10 x 7 for older students (ten years and older). The horizontal components involve generic parts of the story (plot, main character, time, setting, etc.) while the vertical components offer specific content choices (comedy, my brother, midnight, the ocean, etc.).
ii) The teacher or student can give students a set of random numbers that will determine the story formula.
iii) The worksheet included here is completed with space for outlining the story.
iv) Begin to write. Each sentence should be on a separate strip of paper. This is done because it is easier for the LD student and the teacher to correct technical errors, content, and organizational aspects of the narrative.
v) The next stages involve the LD student editing the passage for content and subsequently for COPS.
vi) Writing or typing of the final copy.

Below are examples of a grid, and work sheet.

**Table 4**

**Creative Story Grid (5 x 10)**

| | Main Character (Male) | Main Character (Female) | Plot | Time | Setting (Place) |
|---|---|---|---|---|---|
| 0 | Wayne Gretsky | mother | drama | 12:00 midnight | school |
| 1 | Ted | teacher | comedy | year 2000 | home |
| 2 | Pele | sister | getting saved | after school | the lake |
| 3 | Mick | swimming champion | learning to read | summer | the ocean |
| 4 | father | queen | adventure | sunset | Madrid |
| 5 | principal | Nicki | falling off cliff | sunrise | Toronto |
| 6 | Dr Smith | Marie | bicycle race | 1867 | my bedroom |
| 7 | Mr X | Dr Marie | mystery | suppertime | gym class |
| 8 | leader | Madonna | romance | my birthday | suppertime |
| 9 | teacher | Silken | going to college | during class | in the bus |

**Figure 4**

**Grid Work Sheet**

Name: _____ Date: _____

| Story Element | Number | Specific Element |
|---|---|---|
| Main Character (male) | 5 | Principal |
| Main Character (female) | 6 | Marie |
| Plot | 0 | drama |
| Time | 1 | year 2000 |
| Setting | 9 | in the bus |

**Story Outline**

**2. Mathematics**

While students with learning disabilities are usually first identified because of their reading problems, the correlation between reading and mathematics is high for many students. They both are languages: one primarily qualitative, the other quantitative. Mathematics demands the same essential features--knowledge of basic skills, conceptual understanding, and speed. Learning disabled students may have problems in one, two, or three of these elements.

It has been estimated that lack of competence in the four computational skills (addition, subtraction, multiplication, division) account for 90% of the difficulty experienced by adults in every-day life. In order to be functional in these skills, LD students need a great deal of rehearsal, repetition, over-teaching, and over-learning to ensure that these skills become internalized and come automatically to the student as needed. Because learning these basic skills often become monotonous, it is important to

include games, concrete and abstract materials, multisensory approaches, and problems the students themselves bring to the learning situation. Most of the mathematical programs indicate an appropriate sequence that the teacher can follow. It is important, however, to discover at what point the student is having difficulty.

Counting is a necessary beginning for addition and multiplication. Counting by 1's, 2's, 5's, and 10's underly addition facts and are probably why doubles are so readily added correctly by the LD student. Adding doubles (8 + 8) is easier and faster than adding different numbers. Therefore, teaching LD students to manipulate numbers into doubles improves their accuracy and speed. With a problem like 5 + 7, teach the student to convert the numbers to 6 + 6; 5 + 8 to 6 + 6 + 1. Another important conversion is any problem where a number can be converted to 10. Examples of this is changing 9 + 6 to 10 + 5. A third conversion involves position. LD students need to understand that 2 + 6 is the same as 6 + 2 and that it is more efficient to count on to the bigger number, i.e., 6, 7, 8, rather than 2, 3, 4, 5, 6, 8, 7.

Multiplication is even more dependent on counting than is addition. When students understand the relationship between counting and multiplication, their ability to quickly answer problems that involve these facts is improved. The following matrix involving zero to ten in counting and multiplication, increases the students' understanding of numbers, and makes them less dependent on rote learning.

**Table 5**
**Matrix Showing Relationship between Counting and Multiplication**

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2 | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 3 | 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| 4 | 0 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| 5 | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 6 | 0 | 6 | 12 | 18 | 24 | 30 | 36 | | | 54 | 60 |
| 7 | 0 | 7 | 14 | 21 | 28 | 35 | | 49 | | 63 | 70 |
| 8 | 0 | 8 | 16 | 24 | 32 | 40 | | | 64 | 72 | 80 |
| 9 | 0 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| 10 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

If multiplication is a problem for students, have them build this matrix beginning with the counting they already have mastered. This usually involves 1's, 2's, 3's, 5's, and 10's. Next, teach them to count by 4's. Many students use their fingers while they count, that is fine; in fact, it is useful for them to realize that using fingers can be quite appropriate. However, eventually they should discover that the problem with fingers is that they are slow and as the calculations they must make get bigger, the LD student will want to have mastered addition and multiplication facts rather than have to continue to count.

At this stage, the doubles concept kicks in. We have already discussed how students learn doubles in addition easier and faster than odd numbers. This applies also to multiplication; therefore, many LD students do know these facts. Review them with your students and have them insert the doubles into their matrix.

Next, teach the nine times table. Many LD students think this is very difficult but in fact, the nines times table involves many cognitive aspects that help them learn and remember. Have the student look at the nines table separately to discover some of the relations between the numbers. First have them put down those products they already have inserted into the grid.

**Table 6**

**Nine Times Grid**

| | |
|---|---|
| 9 x 0 = 0 | |
| 9 x 1 = 09 | 0 + 9 = 9 |
| 9 x 2 = 18 | 1 + 8 = 9 |
| 9 x 3 = 27 | 2 + 7 = 9 |
| 9 x 4 = 36 | 3 + 6 = 9 |
| 9 x 5 = 45 | 4 + 5 = 9 |
| 9 x 6 = 54 | 5 + 4 = 9 |
| 9 x 7 = 63 | 6 + 3 = 9 |
| 9 x 8 = 72 | 7 + 2 = 9 |
| 9 x 9 = 81 | 8 + 1 = 9 |
| 9 x 10 = 90 | 9 + 0 = 9 |

Show them that the number in the tens column increases from 0 to 9, while the number in the ones column decreases from 9 to 0. Another approach is to convert the 9 to 10, multiply by 10 and subtract the number you are multiplying by. For example, 9 x 7 = (10 x 7) - 7 = 70 - 7 = 63. And finally the student should always check the answer by adding the two numbers in the product. This should always add up to nine; if it does not, the answer is wrong and the student must do the problem again.

Back to the matrix. At this point, there are only three products that the students do not know automatically or cannot figure out cognitively. These are 7 x 6, 8 x 6, 8 x 7 and usually need to be rehearsed and practiced. This matrix is now complete and should be posted on the inside cover of the student's mathematics workbook for easy reference. The matrix can also be used to help LD students understand 'zero' since it is visually apparent that no matter how big the multiplicand is, if the multiplier is 'zero', the answer is 'zero'.

*a) Perceptual Problems*

If the LD student has perceptual problems, you will observe errors in items such as 1/124 > 1 or 105 ÷ 10 = 15 where the number that looks bigger is impulsively focused upon to determine the answer. Immediate feedback and reteaching of principles of fractions are useful. The student also should be advised to be careful with tricky questions.

Some LD students mix up the symbols in calculations, i.e., x read as +, - read as ÷, - read as =. Flash cards with these symbols prominently drawn and multisensory approaches are two helpful approaches.

In assessment, analysis of the errors the LD student makes can pinpoint his or her problems. One that is frequently found in subtraction comes from inadequate teaching. A frequent instruction when teaching subtraction is to "Take the small number from the big one". While this is true in general, it is not always true when you are dealing with ones in two digit numbers, with ones and tens in three digit numbers, and so on. These are examples of this type of error:

$$\begin{array}{rr} 831 & 481 \\ -\ \underline{465} & -\ \underline{68} \\ 434 & 427 \end{array}$$

Helping a student with this problem is essentially reteaching subtraction including place value and borrowing. As indicated earlier, multisensory approaches, especially those that include concrete materials that the LD student can manipulate, are very helpful for students at all ages.

*b) Word Problems*

When LD students are having difficulty with verbal problems, one of the reasons may be the complexity of the vocabulary, or the length of the sentence. To test this, clarify the vocabulary and/or reduce the length of the sentence. For example, if the original sentence is, "How much change from ten dollars will Mike get if he spends $7.59 at the grocery store?"; reduce the complexity by changing it to "Mike spends $7.59 at the store. He gives the cashier ten dollars. How much change does he get back?".

A second problem with verbal questions is recognizing the cue words that help the LD student translate words into arithmetic problems. Teach the student that "How much is left?" usually translates into a subtraction problem; "How much does each get?" indicates a division problem; "How much do the four boys get?" indicates a multiplication problem; and that "How much do Tony and Gretta get?" usually translates into an addition problem. The subtlety of cues in a word problem needs to be taught to the LD student; the teacher cannot assume he/she knows them.

Another problem the LD student has with both word problems and computations is cluttered pages. This can be most easily remediated by reducing the number of questions per page, or by boxing in a problem.

A creative approach that can help LD students understand underlying aspects in mathematics involves attending to essential facts in problems, and brainstorming a variety of possible solutions. Many LD students think that mathematics is completely structured with only one method of finding an answer. This approach indicates that mathematics can be more flexible. Figure 5 shows an example.

**Figure 5**

**Use of CPS with Mathematics Problems**

*Original Problem:* Mike went to visit a farm. He saw lots of animals running around. He counted 60 heads and 140 legs. The farmer had only chickens and rabbits. How many of each kind of animal did he have?

| **Necessary Facts** | | **Solutions** |
|---|---|---|
| 140 legs | 1 | 70 of each animal |
| 60 heads | 2 | kill while counting |
| 2 legs = chicken | 3 | count them as they go by |
| 4 legs = rabbit | 4 | divide them |
| | 5 | count the eggs |
| | 6 | stamp the chickens |
| | 7 | put a clamp on each animal |
| | 8 | tag them |
| | 9 | chicken = 2 legs, 1 head |
| | 10 | 90 chickens |
| | 11 | 40 of each kind |
| | 12 | 30 of each kind |
| | 13 | 40 of one, 20 of other |
| | 14 | cut off heads & legs & put in bag |
| | 15 | draw 60 circles (heads)<br>put 2 legs for each head<br>20 legs left<br>put 2 more legs on as many animals as possible |
| | 16 | get more rabbits |
| | 17 | kill some chickens |
| | 18 | half are chickens & half are rabbits |
| | 19 | divide 60 heads into 140 feet |
| | 20 | try different numbers until one works |
| | 21 | ask the farmer how many he had |
| | 22 | ask the chickens how many of them there are |
| | 23 | look at the chicken foot ratio 4:2 |

Answer:

1 10 rabbits, 50 chickens
2 a form of trial and error
3 total animals = 60
chickens = x
rabbits = 60 - x
2x + 4 (60 - x) = 140 legs
2x + 240 - 4x = 140
2x = 100
x = 50
therefore, chickens = 50
therefore, rabbits = 60 - 50 = 10

### 3. Social Skills

This section will discuss social skills. One of the most important requirements for personal survival at the secondary level involves basic social competence. Many learning disabled students do not show an 'awareness of the perspective of the other' and their attempts to communicate. Kronick has listed 19 skills in this area that the teacher should assess and provide practice in.

The student who has these social skills is successful in the following areas:

a) identifies and names another person's feelings;
b) expresses his/her own feelings in an appropriate manner;
c) possesses alternate behaviours for expressing emotion;
d) brings others around to see his/her point of view;
e) empathizes with the point of view of others;
f) can imagine and role play social events;
g) notices non-verbal expressions of mood and emotion;
h) respects physical space of others, uses his/her own body appropriately;
i) uses clues about others (clothes, grooming, posture, etc.) to understand them and to behave appropriately;
j) understands the social meaning of house, office, and store layouts;
k) understands single and multiple relationships among people — grandparent, boss, doctor, niece, etc.;
l) understands average capabilities at each stage of life;
m) can tell time, days, weeks, seasons, holidays, their sequence, and the behaviours associated with them;

n) shares in turn-taking in conversations;
o) expresses gratitude to those who have put themselves out for her/him;
p) knows when to stop talking and talks appropriately (on topic, moderate pitch, suitable vocabulary);
q) recognizes the impact of his or her behaviour on others;
r) can plan an experience with a friend; and
s) can function independently when appropriate.

Remediating these skills is primarily a matter of recognizing the deficit and providing opportunities to practice the skill. For example, many learning disabled students have difficulties in pragmatics, i.e., the social rules in using language. Many of them will perseverate, talk non-stop, not give others their turn, and not check whether another is interested in their discourse. In this case, the teacher can suggest to the student that 30 seconds might be the maximum length of time for him or her to talk before checking on whether the conversation is interesting to the other.

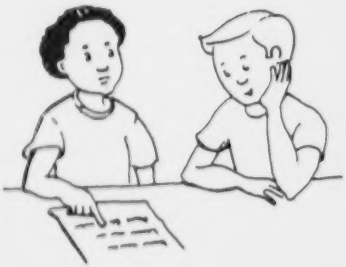
Subtle cues, especially those of a non-verbal nature, often present problems for the learning disabled student. He or she may also have difficulty with the literalness of language. Words or phrases may be both literal in their interpretation, and have symbolic meanings and colloquialisms that the LD student has difficulty understanding. Any of these difficulties in language can result in social problems. These difficulties may occur with the more overt social skills that are also required. This can manifest itself by interfering with personal space, and not being sensitive to the discomfort that invasion of space can cause.

Another aspect of poor usage of language is the concept of "small talk". Most students, especially as they get older, appreciate the value in "small talk" at the beginning of friendships. This is a skill that often needs to be taught quite directly to the LD student. The teacher can model this kind of behaviour, and role playing with peers can reinforce the skill. Watching movies or videos can also demonstrate to the student what is meant by "small talk", and how in fact it is used in introductory social activities.

A second area of problems in the social area can be caused by the complexity of the situation. If too many people are trying to talk to the LD student, he or she may find it very difficult to interact effectively. If possible, the teacher should try and

arrange one-to-one situations, and have the student practise appropriate verbal interactions.

Tutoring is another example of effective interaction among students. This can involve showing how to act in a social situation directly, or it can involve teaching academic programs that also demand social interaction. Most studies have found that both tutors and tutees have improved in skills, both academic and in terms of positive, verbal interactions with each other.



The buddy model has also been found to be effective in aiding the learning disabled student in improving social skills. In this model, students with skill deficits are usually paired with other students who have a wide range of skills. An example would be to pair socially astute students with socially inept ones, good readers with poor readers, responsible students with irresponsible ones. These matches can provide good models and improve the social skills of learning disabled students, but they must be carefully planned, involve frequent meetings, and build in reinforcers for both students if they are to be successful. A way of extending the buddy or peer teaching approach is to include them in contractual teaching.

Contractual teaching is often successful with adolescents. It helps to establish responsibility, incorporates the estimations of the students of his/her own abilities, and commits him/her to courses of action. Weber suggests that establishing a contract should be part of a carefully thought through individualized program. Figure 6 demonstrates a contract for an independent study program that includes checking answers with a buddy. This helps the learning disabled student both academically and socially as they learn to interact and work successfully together.

**Figure 6**

**Contract for an Independent Study Program**

Independent Study Program for

_____

(name of student)

I agree to improve my performance in the following areas:

1 Be punctual and ready for math class.

2 Review fraction and ratio concepts to master.

3 Do any word problems using these concepts correctly.

4 Check answers with my buddy before handing it in.

I will complete the following work during my independent contract period. Each successfully completed exercise will be initialled by my teacher. Punctuality will be checked daily by the teacher.

1 Exercises 1 through 15 (ratio and fractions).
2 Problems listed on pages 20, 26 and 31.

Each completed exercise and correct problem will count for one point.

_____

Signature

_____ _____

Date Teacher's Signature

As Kronick suggested earlier, negotiating is one of the important social skills that many learning disabled students must learn. The following lesson is an example of how such a topic can be discussed and modelled.

a) The teacher introduces the skill to be presented. The students are asked to define negotiating.
b) The teacher may also ask the students to define compromise. The teacher should explain that the students probably negotiate and compromise on a regular basis with their friends and parents.
c) The teacher, with the help of the students, formulates a list of steps involved in negotiating:
    i) stop and look at the body signs of the other person;
    ii) decide if the other person is becoming angry;
    iii) say what you think and how you feel in a friendly manner in order to avoid making the other person angrier;
    iv) ask what the other person thinks or feels;
    v) listen for the answer and do not interrupt; and
    vi) suggest or ask for a compromise that both can agree upon.
d) The teacher asks the students to share any examples of negotiating and compromising they have recently encountered. The students are asked to share their feelings both before and after an agreement is reached.
e) The teacher may want to discuss the advantages to negotiating and compromising as a means of avoiding conflict with others.

*Role Play*

a) The teacher selects students to enact one of the following scenarios:
    i) two friends want to play different games with you at the same time;
    ii) negotiate your bedtime with your parents;
    iii) you have been asked to go out with a friend, negotiate your return time with your parents.
b) The actors use self-talk as they progress from step to step.
c) Other students are selected to act as monitors to verify if all steps have been covered in the presentation.

*Follow-up*

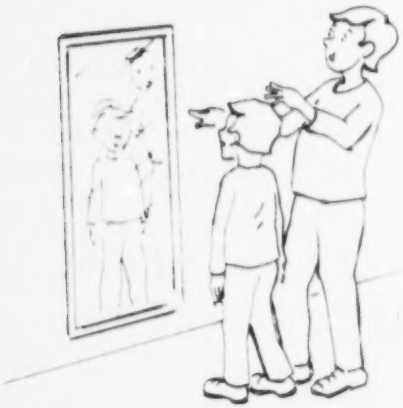
a) Following the presentation, the monitors provide feedback to the actors on their performance. The monitors comment on whether the steps were all completed as well as what they liked or disliked about the presentation.
b) The authors self-evaluate their performance.
c) The actors are praised for what they did well, and provided with constructive criticism in areas needing improvement.
d) The teacher may want the actors to switch roles to gain an understanding of both sides of a negotiation.
e) The remaining scenarios, as well as others added by the teacher, may be presented by other students. Monitors could be chosen for each presentation.
f) The teacher should discuss with the students examples of when negotiating is not possible, such as with people of authority. Rules which everyone must follow, such as laws, are another example. The teacher may want to discuss why we have laws.
g) The teacher should discuss negotiating as the key to avoiding conflict.
h) The teacher should review all the skills needed in solving conflicts: listening, expressing yourself well, and controlling your anger. The teacher should stress to the students that they now have the skills to deal with conflict in a positive manner.

One last aspect of social skills is the importance of attending to the audience. If the student is talking to a school principal or to a minister, it is expected that the language form will be formal, and that he/she probably should take his or her conversational lead from the senior person. Formal dress should also be a clue to the student that the discussion is probably going to involve formal language and concepts. Similarly, the position of the audience in the room, whether it be a boss sitting behind a desk, or a buddy who is sitting beside the student on the floor, the pupil should be able to discriminate the kind of verbal and non-verbal action that will match the situation.

**4. Visual Skills**

Many learning disabled students have considerable difficulty with visual perception. It can be observed in errors concerning the direction of letters (b, d), or in reversal of letters in words such as 'form' or 'from'. In the spelling section discussed earlier, these problems were discussed, as were the importance of

having a sense of how words look. Multisensory approaches to teaching skills that are usually presented, primarily in a visual manner, can be quite helpful.



Many learning disabled students have difficulty in appreciating the importance of appearance from a visual perspective. They may not be aware of dress, neatness, or hair style. This is something that both teachers and parents may help students be aware of. It is not uncommon for basic appearance to influence friendships among peers and acceptance by significant others. Showing the learning disabled student the difference between how he/she can look but does look, and the effect that may have can go a long way in helping the learning disabled student learn the importance of being more sensitive to appearance. A second aspect of appearance involves the look of one's academic work on a page. Smudges, erasures, and scratching out can all affect the evaluation of assignments. It is not unusual for an LD student to know the work and be able to write effectively, but yet lose marks because of the general appearance. Showing students how title pages, drawings, maps, and diagrams should appear on a page and how they should relate to the text can be quite helpful.

**5. Knowledge of Body**

One of the most frequent difficulties the learning disabled student has is being comfortable with the directions which his/her body must move within. It is important to understand directions such as right and left, up and down, big and small in relation to our own body. Some LD students, however, have a great deal of difficulty with these concepts. Right versus left is the most frequent difficulty. Labelling hands as right or left, colour coding hands, wearing a ring on a left hand, etc. are all concrete approaches to helping the student appreciate these

directional concepts. Directional supports probably need to be used with the student until they are internalized and the student can automatically respond to the verbal or visual instruction.

Another way in which some learning disabled students have difficulty with their own knowledge of body is in not being aware of whether their hair is messy or their faces dirty. Although the student may not be aware of these features, they often contribute to a general impression that is not positive. A similar problem within this category is one's sense of size or of parts of the body. A large, but clumsy student may find himself unpopular not for any personal reason, but because the physical appearance is unattractive. Students who have difficulty with social skills can find his/her problems aggravated by an inability to preplan what to wear or how to maximize their looks. Often a student's popularity can be influenced by external appearances. Since this is not dependent on neurological or cognitive difficulties, it is fairly easy to help students understand how they appear and how they could ameliorate a negative impression by dressing appropriately and attending to cleanliness. This is an area where parents can be especially helpful.

Many learning disabled students have difficulties with fine and gross motor coordination. This can be aggravated by problems with knowledge of one's body. Some students will find it difficult to judge how fast they can run or how far they can throw. During adolescence, when so many physical changes are happening, awkwardness can be even more frequently manifested. Physical activities such as speed walking, swimming, skating, or other activities that are more individual in nature can all help the learning disabled student become more comfortable with his or her body and improve their general coordination.

**6. Spatial/Temporal**

An important aspect of the learning disabled student's program must include aspects that involve spatial and temporal abilities. One of the most important aspects of this is organization. Many LD students at school have difficulty finding their materials. They may be five to ten minutes late for a class because they can not find the books or other materials that are needed. Figure 7 is a task analysis for the organization of materials in class readiness. The final goal in this task analysis is "Student will be able to find all materials needed for any school subject within the time allotted to the class." Organizing a remedial

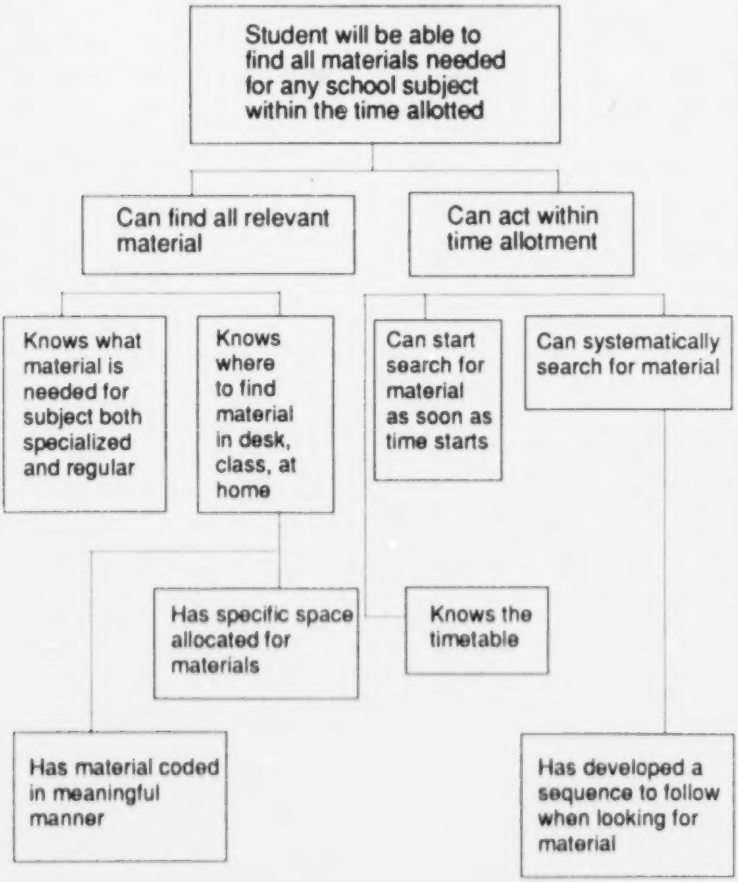
approach in this manner helps the student and the teacher appreciate all of the subtasks that are important in achieving this goal. As can be seen, the two essential elements are being able to act within the allotted time, and the ability to find relevant materials.

Many of these subskills are assumed by teachers to be mastered, but for the learning disabled student, nothing can be assumed. For example, coding material in a meaningful manner is sometimes a problematic activity for the student. Colour coding notebooks can make finding subject notebooks relatively easy.

Parents can help by giving the student a space in his/her room or in some other part of the house that contains all the academic materials needed. Parents will probably need to organize these shelves for the learning disabled student, and check them regularly. As discussed earlier, a preventive aspect to organization is to have special equipment or materials in the same place all the time, ready for an early morning start, or an after school activity. An example would be having all the student's soccer equipment near the door so that in the morning he does not have to spend an undue amount of time looking for things and becoming upset.

**Figure 7**

**Task Analysis for Organization of Materials and Class Readiness**


Student will be able to find all materials needed for any school subject within the time allotted
Can find all relevant material
Can act within time allotment
Knows what material is needed for subject both specialized and regular
Knows where to find material in desk, class, at home
Can start search for material as soon as time starts
Can systematically search for material
Has specific space allocated for materials
Knows the timetable
Has material coded in meaningful manner
Has developed a sequence to follow when looking for material

Directionality is another aspect of spatial difficulties with which the learning disabled student may have difficulty. In the earlier section on understanding of one's body, we discussed how students may have problems with directionality that is understood usually in relation to one's own body.

This can also be seen when the student has difficulty with external spaces. For example, the student may have difficulty with bus routes, with finding his/her way in the school, or in an area of the city or town. Unfortunately, the student often goes the wrong way and finds the right way only through trial and error. Having a parent or adult walk with him until the directions are internalized is important. This is also an area where a peer can act as a buddy and help the student in areas that involve directionality and the development of an inner sense of space.

Not only do many LD students have a poor sense of environmental geography, but also have a poor sense of space on the page. Reducing the amount of content on a page, boxing-in a problem or using colour cues can help the student overcome this problem.

---

*Below is an example of how a student could use Figure 8 (next page)*

**Monday**

| | |
|---|---|
| 7 - 8 am | Get dressed, eat breakfast |
| 8 - 9 | Collect books, walk to school |
| 9 - 10 | Mathematics |
| 10 - 11 | Reading |
| 11 - 12 | Writing |
| 12 - 1 pm | Lunch |
| 1 - 2 | History |
| 2 - 3 | Typing |
| 3 - 4 | Science |
| 4 - 5 | Football practice |
| 5 - 6 | Walk home with friends |
| 6 - 7 | Supper |
| 7 - 8 | Homework |
| 8 - 9 | Talk to friend |
| 9 - 10 | Watch TV |

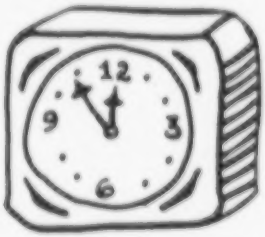
*The total time the student spent going to school and doing homework was 7 hours, eating and doing chores was 4 hours and recreation was 4 hours. In some hours, the student may do more than one type of activity and so should fill in the space to reflect this. Weekdays & weekends when there is no school may be times when more studying can be booked in, if necessary.*

**Figure 8**

**Time Use Chart**

| Time | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|---|
| 7 - 8 am | | | | | | | |
| 8 - 9 | | | | | | | |
| 9 - 10 | | | | | | | |
| 10 - 11 | | | | | | | |
| 11 - 12 | | | | | | | |
| 1 - 2 pm | | | | | | | |
| 2 - 3 | | | | | | | |
| 3 - 4 | | | | | | | |
| 4 - 5 | | | | | | | |
| 5 - 6 | | | | | | | |
| 6 - 7 | | | | | | | |
| 7 - 8 | | | | | | | |
| 8 - 9 | | | | | | | |
| 9 - 10 | | | | | | | |
| Total school & studying | | | | | | | |
| Total meals, doing chores | | | | | | | |
| Total recreation, TV, etc. | | | | | | | |

A third aspect of spatial/temporal difficulty is time. Many LD students have very little understanding of what they do with their time. A fairly straightforward initial step in helping a student with this difficulty is to have them spend a day charting what they do, from rising to bedtime.




The time use chart shown here (next page) can help a student in many ways. Merely paying attention to how he/she uses his/her time is the beginning of understanding how to organize it more effectively. Most LD students require more time learning, rehearsing skills and knowledge than do non-learning disabled students. Therefore, if the student is to have a relatively well-rounded life, he/she has to learn to be well organized around time. The time chart helps him/her decide where to use time more effectively. Once the student understands where his/her time goes, he/she can follow this up with time management check sheets that are appropriate for both single tasks and multiple tasks. These check sheets allow the student to plan with a peer, a teacher, or independently, how much time he/she needs to complete an activity appropriately. These check lists show the student how time can be planned, both in small units that reflect the task as he or she has broken it down, and larger chunks of time that show how and what he/she has to do on a daily basis to be content with the final product.

**Figure 9**

**Time Management Checksheet (Single Task)**

**Task:** Preparing and delivering a speech
**Completion Date:** Wednesday, November 10
**Name:** Dale S.

| *Component* | *Time Needed* | *Completion Date* | *Finished* |
|---|---|---|---|
| Choose topic | 30 mins | October 26 | ✔ |
| Research topic | 2 days | October 27,30 | ✔ |
| Organize notes | 1 hour | October 31 | ✔ |
| Write 1st draft | 1 day | November 1 | |
| Write 2nd draft | 1/2 day | November 2 | |
| Make notes | 1/2 day | November 3 | |
| Rehearse speech | 30 mins for 4 days | November 6-9 | |
| Give speech | 5 mins | November 10 | |

**Time Management Checksheet** (Multiple Tasks)

| *Activity* | *Due Date* | *Estimated Time Needed* | *Day(s) Planned to do Task* | *Finished* |
|---|---|---|---|---|
| Finish Math homework | Monday | 40-60 mins | Monday | ✔ |
| Study for science test | Friday | 3 x 1/2 hr periods | Tuesday<br>Wednes.<br>Thursday | ✔<br>✔<br>✔ |
| Start social studies project | Friday March 23 | 3 x 1/2 hr periods | Monday<br>Wednes.<br>Friday | ✔<br><br>✔ |
| Review spelling | Friday | 30 mins | Thursday | |

**Time Period:** March 12-16 **Name:** Mary W.

An approach that is helpful in solving academic and personal problems is the *Creative Problem Solving (CPS) Technique.* (A reduced form of this approach was discussed in the mathematics section.)

This model has five stages:

- problem statement
- needed facts
- solutions
- best solutions
- action plan.

In finding the problem statement, the student is asked to generate several ways of stating the problem until he/she decides which statement best reflects the situation to be addressed.

Stage 2 looks at the facts that are needed to solve the problem. For some problems, all of the facts are contained within the problem statement. This is the situation in solving mathematics problems. Other problems, however, require that the student search out some of the facts. This is shown in Figure 10 when it was necessary for the student to check with the teacher whether he/she would accept a tape as part of the total presentation.

Stage 3 asks the student, either independently or with a small group, to brainstorm for solutions. In Figure 10, the example was worked through with a teacher and learning disabled student. When we have used this same approach with larger groups, there tends to be some silliness at this point. It is important to allow this, however, because it can result in piggybacking or moving from foolishness to a more serious idea that may be quite useful. After the student has produced several solutions, it is necessary to find the best one. Criteria are developed and then several of the ideas are subject to scrutiny of the criteria. Once a solution is chosen, the student works on an action plan that includes the time, activity, and whether it has been completed or not. This is very important because learning disabled students often have limited sense of time and will leave much of the work required in a project such as this one until it is too late to do the work well. In this case, they might fail, not because they were not capable of doing the project well, but because their organizational skills and time misunderstandings confounded their work.

**Figure 10**
**An Example of the CPS Technique Used to Solve an Academic Dilemma**

***Original Problem:*** *How can I do a project on the War of 1812 without getting bogged down by words and writing?*

| ***Statement*** | ***Needed Facts*** | ***Solutions*** | | ***Best Solution*** |
|---|---|---|---|---|
| 1 How might I do my share of work on the project without having to write out the text?<br><br>2 How might I look at the effect on family life of the War of 1812?<br><br>3 How might I convince my group to act out a short play about the War of 1812?<br><br>4 How might I get the teacher to forget about projects?<br><br>5 How might I get the teacher to let me tape my ideas and text as well as sound effects, etc.? | Project must be 10 pages in length or 1500 words.<br><br>It should be accompanied by graphs, pictures, tables, etc.<br><br>It must be handed in four weeks from now.<br><br>There are four people in the group – the others read and write OK.<br><br>A tape would be acceptable as part of the total presentation. | 1 Change requirements from 1500 to 150 words.<br><br>2 Use pictures instead of written text.<br><br>3 Draw a mural that will trace the war over many stages.<br><br>4 Have someone do a bugle & drum roll.<br><br>5 Make a tape of a bugle & drum roll.<br><br>6 Get a film from ETV<br><br>7 Find some slides or a filmstrip in teacher resource centre.<br><br>8 Enact a scene between a father and child as he leaves to fight. | 9 Interview my brother who is taking local history in high school.<br><br>10 Interview on tape Mr X who is our local expert on the subject.<br><br>11 Go down to the Canadian History Museum, talk to curator, try to borrow some stuff.<br><br>12 Take some pictures of historical plaques that mark battle sites.<br><br>13 Do a rubbing of some plaques.<br><br>14 Coordinate a presentation rather than just a written essay.<br><br>15 Record my share of project on tape (with sound effects). | *Criteria*<br><br>Possible solutions (from idea finding) / Can I do it? / Will teacher accept it? / Will group think it's fair? / Will we get a good mark? / Total<br><br>1 / 1 / 1 / 3 / 1 / 6<br>7 / 2 / 3 / 2 / 2 / 9<br>10 / 3 / 3 / 3 / 2 / 11<br>15 / 3 / 3 / 3 / 3 / 12<br><br>(Final choices at each stage were 1, 7, 10, 15). In this case, recording his share of project on tape seemed to be the best solution. However, number 10 received strong support too, so it was combined with 15 and became a major part of Tom's tape. |

**Figure 10** (continued)

**Action Plan**

| When | What | Done |
|---|---|---|
| Oct 10 | Talk to teacher about accepting various modes of presentation | ____ |
| Oct 10 | Talk to group about a fair share of work | ____ |
| Oct 12 | Set up interview with Mr X for a specific time | ____ |
| Oct 14 | Borrow tape recorder and be sure I can use it | ____ |
| Oct 14 | Buy a new tape for interview and one for presentation | ____ |
| Oct 18 | Get help from brother and teacher on good interview questions. Write these out in point form | ____ |
| Oct 20 | Decide what else I am including in my tape and where interview fits in | ____ |
| Oct 24 | Interview with Mr X | ____ |
| Oct 30 | Do final tape | ____ |

The routines of the day are important to internalize. It saves a student considerable time if he/she knows the order in which things are done. If the routine involves waking up at seven o'clock, making the bed, washing, dressing, eating breakfast, and finding the materials needed for the day, this should be the pattern of his/her early morning everyday. Once this routine is automatic, the student no longer has to think about it, and he/she can use cognitive skills for new situations. For the activities that are not part of daily routines, the student should be taught the use of calendars, diaries, and clocks. Some learning disabled students have difficulty with analogue clocks, and for



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them, digital clocks are much easier to interpret. If there are no digital clocks or watches available, and if the student is older, the teacher might refer to a primary level sequence that addresses teaching how to read a clock. Encouraging the student to use diaries and calendars is also very helpful. If they become used to marking down every activity, whether it is regular or unusual, they have a constant reference to help them organize their time.

**Figure 11**

**Visual Spatial Problems**

| | *Stimuli* | *Answer* |
|---|---|---|
| 1 | standing<br>mis | misunderstanding |
| 2 |  | hole-in-one |
| 3 | exxposure | double exposure |
| 4 | Rforkoad | fork in the road |
| 5 | Blouse | see-through blouse |
| 6 | ICE | thin ice |
| 7 | U P | split up |
| 8 | S<br>U<br>N | sundown |
| 9 | W<br>A<br>T<br>E<br>R | waterfall |
| 10 | lip lip | tulips |
| 11 | DNUORG | background |
| 12 | R<br>R E D<br>D | red cross |

A final suggestion for helping students who have spatial/temporal problems is to introduce tasks that demand the student to use their cognitive skills in a more flexible manner than they are used to. Figure 11 shows how students can have fun and stretch their creative capacities. The items shown in Figure 11 have come from various sources: books, magazines, and newspapers. Learning disabled students do not have much remedial time to spend in fun, and yet these types of activities increase their flexibility and their appreciation of language. While you can find examples of these problems in many sources, students themselves can create them, especially those students who are both learning disabled and gifted.

**7. Practical**

As described earlier, some of the most difficult skills for the learning disabled student are those we have labelled practical. These can include: not noticing that plants need to be watered, that food needs to be bought, or that meals need to be made. This is more likely to be a problem for the older student or adult. Making a check list, either on your own or with a teacher, can be a first and very effective step in helping the learning disabled student. Some LD students are not able to do things efficiently; they are unable to juggle several activities simultaneously and they may not be able to prioritize activities. An effective approach in each of these situations is to model efficient functioning. In this case, the teacher may show the student how to do it, as could the parent or peer. The most frequent approach to modelling is to have the teacher talk through the problem. The student watches, goes through the motions, and talks them through aloud. The student practices the activity until he/she can perform the act automatically.

A final practical problem that frequently can be observed in the learning disabled student is forgetting what they have to do. Again, making lists on a daily basis that includes all the activities that he/she must complete during the day is quite helpful. Another approach can involve mnemonics. For example, if the student wanted to internalize his or her morning routine, he or she could make an anagram that included these four activities: make the bed, find your books, make lunch, and check time. This could be shortened to bed, books, lunch, and time which in turn could be made into a sentence using the first letter of each word. 'Beautiful Betty loves Thomas' would be an example of a mnemonic that helps a student remember his or her morning routine.

## Guidelines for Parents

You are the most important resource your child has. Teachers and other professionals come and go whereas you have a relationship with your child throughout your life. All children can be restless, inattentive, impulsive, overactive, forgetful, or poorly organized at times. If a child seems to have some of these problems much of the time, there might be many possible reasons for this, with LD being merely one possibility. Therefore, if you have concerns about your child's ability to handle her/himself academically, socially, athletically, or in the practical sphere, a psychological or educational assessment might be able to suggest possible reasons for the difficulty, and offer a course of action.

Even if you learn that your child has a learning disability, it is still important to know how it manifests itself in her/his approaches to tasks and situations at home, in school, and with other children. Then you are in a position both to be your child's advocate with teachers, other professionals, people who will have prolonged contact with her/him, and to generalize approaches across home and school. This might mean asking her how she will remember to take the garbage out, and wondering whether the strategy that she used to remember her school assignment would be helpful in this context, or whether learning how to check an assignment provided any clues that would help him check the adequacy of the job he did when cleaning his bedroom. Once you understand the way your child deals with information and approaches tasks, you then can explain the LD to her/him, to other family members, neighbours, friends and professionals.

As important as it is to understand and accommodate your child's LD and to be her/his advocate, most important of all is to be your child's parent. This includes conveying to the child that s/he matters in your life, that you think that s/he is wonderful and welcome her/him joyously when s/he comes home or your paths cross, and that home is a haven from the demands, frustrations and failures of the outside world. It means that you acknowledge her/his feelings and perceptions, and talk about her/his experiences. Being a parent involves protecting or "holding" your child both physically and psychologically so that s/he does not have to cope with more stimulation or changes than s/he can handle, or be expected to cope with tasks that are too overwhelming or beyond her/his capacity. It includes containing and

supporting her/him so that his/her impulses, anger, and destructiveness do not exceed bounds. It involves gearing your language to your child's comprehension, and your shared leisure activities to a child's level of motor coordination and understanding of the rules and spatial layout of games, e.g., which goal belongs to the opposite team. Being a parent includes trying to make the changes in a child's world that would make the child more comfortable and functional.

Effective parents impose limits on children and have reasonable expectations while supporting their children to be a bit more than they presently are. They believe in their children's ability to create a life for themselves. Children who feel that they can count on their family's loyalty, reliability, support, acceptance and affection are better equipped to cope with the difficulties their LD creates in their lives.

Having a child with LD is not easy. It is particularly important that the parents support one another in their efforts, taking over when one or the other becomes discouraged or overwhelmed, and expressing optimism that events will improve. Ideally both parents should be involved in meeting with teachers and other professionals. It also is important that the LD not take over the waking day. The parents as individuals, as a couple, and the other children in the family have a right to their own pursuits, to attention, and care. The child with LD also has a right to leisure time, to a well-rounded life, and to many opportunities to play with friends. This must be arranged even if it means that the child with LD is exposed to fewer therapeutic activities.

Do not baby your child or do too much for her/him, even though it is easier to do tasks yourself than to deal with the child's frustration, anxiety, or ineptitude. Expect age-appropriate behaviour. Simplify tasks until you reach a level that the child can execute. If he cannot catch a small ball, perhaps he can catch a large one if it is thrown close to him. If she cannot cut her food, perhaps she can learn to do so if your hand does it over hers. If he is overwhelmed at the thought of making a bed, possibly he can do it step-by-step, starting with putting the bottom sheet on and tucking it in.

Provide over-exposure and generalization. Leave notes under her/his plate and pillow, and on the door with pleasant messages, being sure to use the words s/he is learning to read, again and again. Describe upcoming changes in the child's

routine so that s/he has a chance to imagine them. Most importantly, try to be as adult as you possibly can be, therefore, being a model your child can count on and emulate. Remember that your child will mature and improve, as we all do. Increasingly s/he will make her/his own decisions, and create a life for her/himself in which the LD will be a minor annoyance rather than the major obstacle as was in childhood.

## Glossary

**Behaviour Modification** – systematic arrangement of environmental events (ABC – antecedent, behaviour, consequence) to produce specific changes in observable behaviour.

**Bit** – a small quantity; refers to amounts of memory available to working memory.

**Closure** – to complete a sentence or task.

**Cognitive Disability** – disorder in the use of symbols and concepts involving thinking, reasoning, planning, organization, and problem solving.

**Concrete Thought** – thinking of objects or events only in terms of their superficial characteristics.

**Idiogram** – a picture or symbol used in writing, example: Chinese.

**Integration** – the mixing of handicapped and non-handicapped in educational and community environments.

**Kinesthetic** – receiving meaning from stimuli through muscular parts of body.

**Metacognition** – the self control of one's own behaviour, including self-instruction, self-monitoring, self-reinforcement, and self-evaluation.

**Mnemonics** – strategies or aids to help in remembering.

**Modelling** – behaviour that is learned or modified by observing and imitating the actions of others.

**Perseveration** – excessive repetition of actions, words, or excessive discussion of one subject.

**Pragmatics** – the usage of language.

**Scaffolding** – providing supporting framework and focus to enable someone to execute a task or organize their language.

**Semantics** – the branch of language concerned with the nature and development of the meaning of language.

**Tactile** – receiving meaning from stimuli by using touch.

## Resources

(alphabetically by country name)

SPELD NSW Inc.
129 Greenwich Road
Greenwich 2065, N.S.W.
AUSTRALIA

Association Belge de parents
d'enfants en difficulté
d'apprentisage (APEDA)
12 rue du Printemps
B-1380 Ohain
BELGIUM

Croatian Association of
Psychologists
Anke Butorac 10
41000 Zagreb
CROATIA

Learning Disabilities
Association of Canada
323 Chapel Street
Ottawa, Ontario K1N 7Z2
CANADA

International Foundation
of Learning
#336 - 5740 Cambie Street
Vancouver, British Columbia
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CANADA

Dr. Clara Ines King Delarrarte
Psicologa U.N.
Dificultades En El Aprendizaje
Diagonal 53, No. 48-39
Bogota, D.E.
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HOLLAND

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University of the Witwatersrand
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SOUTH AFRICA

Asociacion De Padres De Ninos Con Dislexia Y Otras Dificultades De Aprendizaje
Plaza San Amaro 7
28020 Madrid
SPAIN

Mrs Jean Petersen
Learning Disabilities Association of America
4156 Library Road
Pittsburgh, PA 15234
UNITED STATES

Yugoslav Association of Defectologist
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7100 Sarajevo
YUGOSLAVIA

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